PB81-159808

Sewage Effluent Disposal for the City of Bend, Oregon

Jones and Stokes Associates, Inc.
Sacramento, CA

Prepared for

Environmental Protection Agency
Seattle, WA

Dec 80

U.S. Department of Commerce
National Technical Information Service
NTIS

EPA 910/9-80-074

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

PB81-159808

Water

EPA-10-OR-Deschutes-Bend-WWTW-80

EPA

Environmental Impact Statement

Final

Sewage Effluent Disposal for the City of Bend, Oregon

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO.
EPA 910/9-80-074

2.

3. RECIPIENT'S ACCESSION NO.
PB81 159808

4. TITLE AND SUBTITLE
SEWAGE EFFLUENT DISPOSAL FOR THE CITY OF BEND, OREGON. FINAL ENVIRONMENTAL IMPACT STATEMENT.

5. REPORT DATE
December 1980

6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)

8. PERFORMING ORGANIZATION REPORT NO.

9. PERFORMING ORGANIZATION NAME AND ADDRESS
Jones & Stokes Associates, Inc.
2321 P Street
Sacramento, California 95816

10. PROGRAM ELEMENT NO.

11. CONTRACT/GRANT NO.

12. SPONSORING AGENCY NAME AND ADDRESS
U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, WA 98101

13. TYPE OF REPORT AND PERIOD COVERED
Final EIS

14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The purpose of this final EIS is to present to the public EPA's position on disposal of treated wastewater from the newly constructed Bend, Oregon wastewater treatment plant. Treated wastewater was originally to be disposed of through the use of drill holes, lava sink tubes or fractured rock. This proposed action was found by EPA to have significant, long term adverse effects on regional groundwater. Six alternative disposal systems are evaluated in this EIS and an interim alternative for effluent disposal discussed.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Sewage Treatment Plants Groundwater Environmental Impact Statements Oregon	Bend, Oregon	

18. DISTRIBUTION STATEMENT
Release Unlimited

19. SECURITY CLASS *(This Report)*
unclassified

20. SECURITY CLASS *(This page)*
unclassified

21. NO. OF PAGES
128

22. PRICE

EPA Form 2220-1 (9-73)

FINAL ENVIRONMENTAL IMPACT STATEMENT

SEWAGE EFFLUENT DISPOSAL FOR THE CITY OF BEND, OREGON

Prepared by

U.S. Environmental Protection Agency
Region 10
Seattle, Washington 98101

With Technical Assistance from
Jones & Stokes Associates, Inc.
2321 P Street
Sacramento, California 95816

Responsible Official:

Donald P. Dubois
Regional Administrator

12 DEC 1980
Date

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
Chapter 1 - INTRODUCTION	5
History of the Project	5
The Study Area	9
Chapter 2 - EFFLUENT DISPOSAL ALTERNATIVES	13
Projects Evaluated	13
Chapter 3 - ALTERNATIVES ACCEPTABLE TO EPA	21
Introduction	21
Discharge to the North Unit Main Canal	21
Evaportation and Infiltration Through the Soil Mantle	25
Chapter 4 - COMMENTS AND RESPONSES TO THE DRAFT EIS	41
Letters of Comment	41
Public Hearing Summary	88
Chapter 5 - COMMENTS AND RESPONSES TO THE FINDING OF NO SIGNIFICANT IMPACT (FNSI) AND SUPPLEMENTAL FNSI	91
Letters of Comment	91
Public Hearing Summary - June 9, 1980 FNSI	101
Chapter 6 - LIST OF PREPARERS OF FEIS	103
Chapter 7 - BIBLIOGRAPHY	105
References	105
Personal Communications	106
Chapter 8 - APPENDIX	107

LIST OF TABLES

Table		Page
2-1	Summary of Effluent Disposal Alternatives Evaluated for the City of Bend and Their Current Status as Ultimate and/or Interim Disposal Methods	14
3-1	Impacts Associated with Discharge of Effluent to the North Unit Main Canal and Potential Mitigation Measures	23
3-2	Groundwater Constituents and Their Proposed Sampling Frequency - Background Monitoring Program	32
3-3	Impacts Associated with Discharge of Effluent to Infiltration Ponds and Potential Mitigation Measures	38
4-1	Summary of Letters of Comment on the City of Bend Draft EIS	42
4-2	Summary of Public Hearing Testimony for the City of Bend Draft EIS	90

LIST OF FIGURES

Figure		Page
1-1	Diagram of a Typical Domestic Sewage Disposal System in the Bend Area	6
1-2	The Study Area	10
2-1	Treatment Plant Locations and Proposed Effluent Disposal Areas (Sites C & E)	16
3-1	Location of Interim Infiltration Pond - Site E	27
3-2	Design of the Interim Effluent Infiltration Facility	28
3-3	Approximate Monitoring Well Locations	33
3-4	Typical Deep Monitoring Well	34
3-5	Typical Intermediate Monitoring Well	35
3-6	Typical Shallow Monitoring Well	36

EXECUTIVE SUMMARY
ENVIRONMENTAL IMPACT STATEMENT

Draft ( )

Final (x)

Prepared by: U. S. Environmental Protection Agency
1200 Sixth Avenue, Region 10
Seattle, WA 98101

Type of Action: Administrative

The City of Bend, Oregon applied to the Oregon Department of Environmental Quality (DEQ) and the Environmental Protection Agency (EPA) in 1977 for grant funds to construct a new 6 MGD wastewater treatment plant at a site approximately 4 miles northeast of the City. Treated sewage effluent was to be discharged to a drill hole near the plant. In 1977 sewage collection and treatment was being provided for about 10 percent of the City's population while most residents were on septic tanks discharging to lava sink holes or drill holes. Sewage discharge into holes in the rock structure was declared a potential public health hazard by the DEQ because of the potential for contamination of domestic water supply wells. Regulations adopted by DEQ to prohibit the use of waste disposal wells after 1980 prompted the City to study alternative methods of effluent disposal.

The City's application for federal funds to construct a 6 MGD wastewater treatment and disposal facility was reviewed by EPA. During such reviews, the National Environmental Policy Act (NEPA) requires EPA to assess the environmental effects of the proposed project. If significant adverse environmental impacts are likely to result, EPA must prepare an Environmental Impact Statement (EIS). During the NEPA assessment, EPA concluded that no significant impacts would result from the construction and operation of the proposed new wastewater treatment plant. The proposed method of effluent disposal, however, was found to have the potential to significantly affect groundwater resources used for domestic water supply, thus an EIS was required for the disposal facility.

A grant offer to construct the wastewater treatment plant was approved by DEQ and EPA, and the plant will be operating in late 1980 or early 1981. Since the treatment plant will be operational before final selection of a long-term effluent disposal system, an interim project using surface infiltration was subsequently funded by EPA to accommodate initial operation of the plant.

The use of drill holes, lava tubes, or fractured rock as a means of wastewater disposal, such as originally proposed by the City, was found by EPA to have potentially significant, long-term adverse impacts on regional groundwater resources that supply domestic and agricultural users. EPA based its conclusions on information contained in the Draft EIS. In addition, the Clean Water Act, administered by EPA, requires the agency to protect from degradation, groundwater systems that are now or can be used for domestic supply.

As a result of EPA's decision to prepare an EIS, numerous effluent disposal methods were identified in facilities plan reports (Design Definition Memoranda) prepared by Bend Engineering Consultants (1977a). These reports included effluent disposal methods previously identified by Stevens, Thompson and Runyan, Inc., in the City's original facilities plan dated September 1976. The effluent disposal alternatives were fully evaluated by EPA in the Draft EIS which was distributed for public review and comment in September 1979.

In the process of developing the EIS, EPA reduced the number of effluent disposal alternatives to the following six:

1. Discharge to drill holes or fractured rock.
2. Discharge to infiltration ponds.
3. Discharge to the Deschutes River.
4. Discharge to sealed evapotranspiration ponds.
5. Land application by spray irrigation.
6. Discharge to the North Unit Main Canal.

These alternatives were selected for detailed evaluation in the Draft EIS; other identified alternatives were eliminated from detailed evaluation on the basis of cost and feasibility.

The purpose of the Final EIS is to present to the public, EPA's position on disposal of treated wastewater from the newly constructed Bend wastewater treatment plant. In its evaluation of the six alternatives listed above, EPA concluded that discharge to the North Unit Main Canal would be the most environmentally sound method of effluent disposal. This alternative is also one of the least costly methods evaluated. As a result of numerous meetings between EPA, DEQ, the City of Bend, and the North Unit Irrigation District, it was realized, however, that many institutional constraints precluded implementation of this alternative at this time. Because the

City's new treatment plant was nearing completion, and the City had committed to a financial plan for the wastewater system, the City proposed to EPA an interim alternative for effluent disposal. The interim alternative could be operational at the time of plant start-up.

After incorporating EPA-suggested modifications to this interim effluent disposal system, a finding of no significant impact was released by EPA, and the City proceeded to design and later construct the interim disposal facility. This facility has an estimated capacity of 2.5 MGD. It is located less than 1 mile from the new treatment plant on land leased from the U. S. Bureau of Land Management (BLM) for 3 years. This interim facility is conceptually the same as the infiltration alternative evaluated in the Draft EIS and described in this Final EIS.

In providing financial assistance, EPA is requiring the City to conduct extensive groundwater monitoring during operation of the interim facility to determine its effectiveness and its potential for incorporation into the ultimate effluent disposal solution. Because of the short-term lease arrangement with BLM and the limited capacity of the interim facility, it is important that the City continue to pursue their ultimate effluent disposal solution. Such activities must include: 1) further efforts toward negotiating an agreement with the North Unit Irrigation District for utilization of the treated effluent for agricultural purposes in this limited water supply area, 2) encouragement by the City to ranchers and farmers to use the reclaimed wastewater, 3) coordination and provision for effluent reuse on a seasonal basis through the use of holding facilities, and 4) consideration of modifying the interim facility to a size capable of handling the projected 20-year effluent flow of 6 MGD.

The use of BLM land is a major consideration in the City's choice of future actions. The 440-acre site of the interim project was leased by the City from BLM for $330 for a period of 3 years. The lease has several general and specific stipulations. One very confining stipulation requires the City to notify the BLM by September 24, 1982 if the interim project will be a part of the permanent 20-year disposal project. If not, the land must be rehabilitated by the end of the third and final year of the lease. Also, the lease may not be extended or renewed as an interim disposal project.

The EPA will prepare an environmental report consistent with NEPA and CEQ guidelines on the permanent project applied for by the City of Bend. This NEPA report will then be available to the BLM for their use relative to any land use permits and land leases required by the City of Bend.

Chapter 1
Introduction

Chapter 1

INTRODUCTION

History of the Project

In 1970 the City of Bend constructed a sewage collection and treatment plant designed to serve a population of 20,000. At that time the urban area population was 19,150. By 1974 the urban population had grown to 25,690 and is projected to be 60,000 by the year 2000.

The existing wastewater treatment plant was designed to produce an average sewage flow of approximately 2 MGD. The facility provides secondary treatment (activated sludge process) and discharges disinfected effluent into a lava sink hole on the plant site. The plant presently treats and discharges an average sewage flow of 0.5 MGD.

Five other wastewater treatment and disposal facilities are operated in the study area. They are small units serving apartment complexes and industries, and most are approved for interim use until a regional sewage system becomes available.

The majority of domestic wastes are disposed of through septic tanks discharging to lava sink holes or drill holes (Figure 1-1). Approximately 6,000 to 7,000 of these waste disposal wells are currently utilized in the Bend area. This method of disposal is necessary because the soil overburden is generally less than 12 inches deep, which does not provide sufficient surface leaching.

These several thousand waste disposal wells create a potential for contamination of domestic well water supplies, and thus are a public health hazard. A study done by the Federal Water Quality Administration entitled Liquid Waste Disposal in Lava Terrane of Central Oregon concluded that a continued discharge of septic tank wastes to drill holes posed a potential hazard to the quality of the groundwater (Sceva 1968). Subsequently, DEQ promulgated regulations prohibiting the construction of additional lava sink holes for disposal of inadequately treated wastes in the Bend urban area after January 1975 and prohibiting their use beyond January 1980.

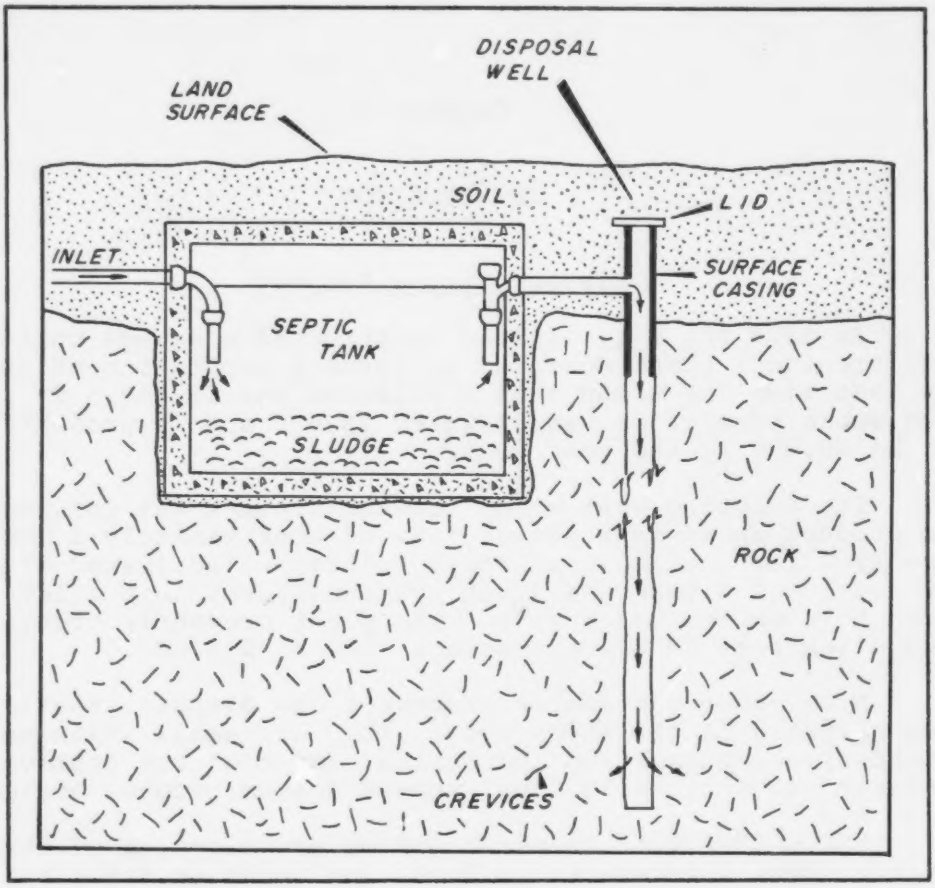

DISPOSAL WELL
LAND SURFACE
SOIL
LID
INLET
SURFACE CASING
SEPTIC TANK
SLUDGE
ROCK
CREVICES

FIGURE 1-1. DIAGRAM OF A TYPICAL DOMESTIC SEWAGE DISPOSAL SYSTEM IN THE BEND AREA

SOURCE: SCEVA, 1968

As a result of these regulations and a formal requirement issued to the City by DEQ, on September 5, 1975 as part of the waste discharge permit, the City of Bend initiated a study to determine the proper treatment and disposal of sanitary wastes for the Bend urban area A report entitled Sewerage Facilities Plan, City of Bend, Oregon was prepared for the city in September 1976 by Stevens, Thompson & Runyan, Inc. and Tenneson Engineering Corporation. In this document the recommended plan called for expansion of the existing wastewater treatment facility to a capacity of 6.0 mgd. Approximately 150,000 linear feet of collector and interceptor sewers would be installed, and disposal of treated effluent would be through year-round spray irrigation on approximately 600 acres located about 3 miles north of the treatment plant.

In 1977, the City of Bend applied to the EPA for 75 percent funding of their proposed sewerage facilities plan under the Construction Grants Program authorized by the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500). After review of the City's facility plan, the EPA determined that the proposed project did not constitute a significant impact and therefore did not require an EIS. An April 5, 1977, the EPA released a Negative Declaration announcing its preliminary decision not to prepare an EIS. This decision was based on the fact that the proposed project conformed with the City's local land use plan and with statewide planning goals and guidelines. The City's proposed project to sewer the entire City of Bend would also be necessary to comply with state water quality requlations.

On July 8, 1977, upon completion of the 15-day comment period on the Negative Declaration, EPA awarded a Step II grant to the City of Bend for design of the proposed project. After reevaluation of the proposed project, however, the City decided to reject the plan approved by EPA and instead proposed to construct a new secondary wastewater treatment plant at a site on BLM land approximately 4 miles northeast of the existing facility. The effluent would be filtered, disinfected and discharged year-round to the subsurface via drill holes or lava tubes or cracks on the new site as an interim measure with a permanent disposal method to be applied for at a later date. The existing treatment plant and disposal site would be abandoned.

The City applied to the EPA for this relocated new facility in Amendment Number One to the Sewerage Facilities Plan (BECON 1977b), contending that a comparative cost analysis of the treatment alternatives showed the total cost was essentially the same for either alternative. The City also contended that major environmental impacts would occur if the existing plant was expanded. Among these nuisance impacts were noise and odor problems relating to recent residential developments around the existing facility.

To review costs associated with the two treatment plants and relocation to the new site, the EPA contracted Brown and Caldwell Engineers to perform an independent cost comparison analysis. The Brown and Caldwell analysis reported that construction of the new plant would be as cost-effective as expansion of the existing plant. As a result, on April 5, 1978, the EPA issued a Negative Declaration for design and construction of the new wastewater treatment plant, and collector and interceptor sewers. However, the EPA decided to prepare an EIS on the ultimate means of effluent disposal because the City's newly proposed project contained significant changes in the method of effluent disposal.

The City's new treatment plant was scheduled for completion and start-up in late 1980. It was recognized that the EIS process and selection of a permanent effluent disposal alternative might not be completed before plant start-up; therefore, emphasis was changed by the City and EPA to evaluating and selecting an interim effluent disposal alternative. The City had received approval from DEQ for use of subsurface disposal (defined as a drill hole) as an interim method of effluent disposal. The EPA would approve interim use of a drill hole only if it was found to be environmentally acceptable, and if no other method of disposal was available.

After release of the Draft EIS (October 1979) and the EPA public hearing, several meetings were held, with the City of Bend, DEQ and EPA to discuss interim effluent disposal alternatives. As a result of these meetings, the City's consultant, BECON, prepared Design Definition Memorandum No. 11, Subsurface Effluent Disposal Feasibility Investigation, dated December 1979. In Memorandum No. 11, the City recommended the design and construction of a surface infiltration-overflow pond for interim effluent disposal along with an extensive wastewater monitoring program. In this alternative effluent would be discharged into a pond on Site E for soil infiltration and evaporation. The size of the infiltration area would be 80-100 acres. Construction of the pond would include the removal of soils to underlying basalt rock near the center of the pond. The rock would be fractured by explosives to depths on the order of 20-25 feet. The excavated and fractured rock area would be surrounded by a berm so that water would only flow into this area after the pond has filled to overflow capacity.

The EPA viewed this alternative as nearly the same as drill hole and lava tube disposal. In the viewpoint of EPA it is advantageous to use the wastewater treatment and disinfection capabilities of soil filtration. Consequently, subsurface disposal should rely on filtration through a minimum of 3 feet of soil. EPA conditionally approved the soil infiltration alternative by excluding the overflow features, clearing of the clay overburden near the center of the natural depression, and fracturing rock. EPA's conditional approval was based on a number of concerns that needed to be satisfied prior to a decision to provide grant assistance for the construction of the proposed interim effluent disposal project. These additional EPA concerns were addressed by BECON in a February 1980 report entitled Environmental Information Document, Effluent Containment Pond and Ground Water Monitoring Systems.

On June 9, 1980, the EPA released a Finding of No Significant Impact (FNSI) on the interim effluent disposal facility described above. However, during the 30-day comment period on the FNSI, additional information was developed regarding the proposed disposal facility. This information was made available for public review on August 15, 1980 in a Supplemental FNSI. Based on the Supplemental FNSI, the June 9, 1980 Environmental Assessment and FNSI and public comments, the EPA made a final decision in September 1980, that an EIS for the proposed interim effluent disposal facility would not be prepared.

During the same period, the BLM prepared an Environmental Assessment of the proposed interim effluent disposal facility, which would be located on BLM land. The BLM also concluded that an EIS would not be required for the proposed facility. Subsequently, the BLM issued a three-year lease for use of 440 acres for the interim effluent disposal facility and monitoring well system. On September 30, 1980, the EPA awarded the City of Bend a Step III construction grant to begin construction of the interim effluent disposal facility and monitoring well system. The projected date for completion of construction is January 1981.

A decision has not been made on a permanent effluent disposal facility. This Final EIS is a special purpose document which identifies the actions taken by EPA to date and subsequent action to be taken by the City for the ultimate effluent disposal facility. The City was awarded an EPA grant to construct, operate and monitor the interim disposal project. The information gained is expected to allow the City to apply to EPA for a grant to construct a permanent facility.

The Study Area

The study area, extending from the City of Bend and its surrounding urban area north to the Madras area, is located in Deschutes and Jefferson Counties in west-central Oregon (Figure 1-2). The area is characterized by gently rolling high desert terrain, bisected by the deep canyons of the

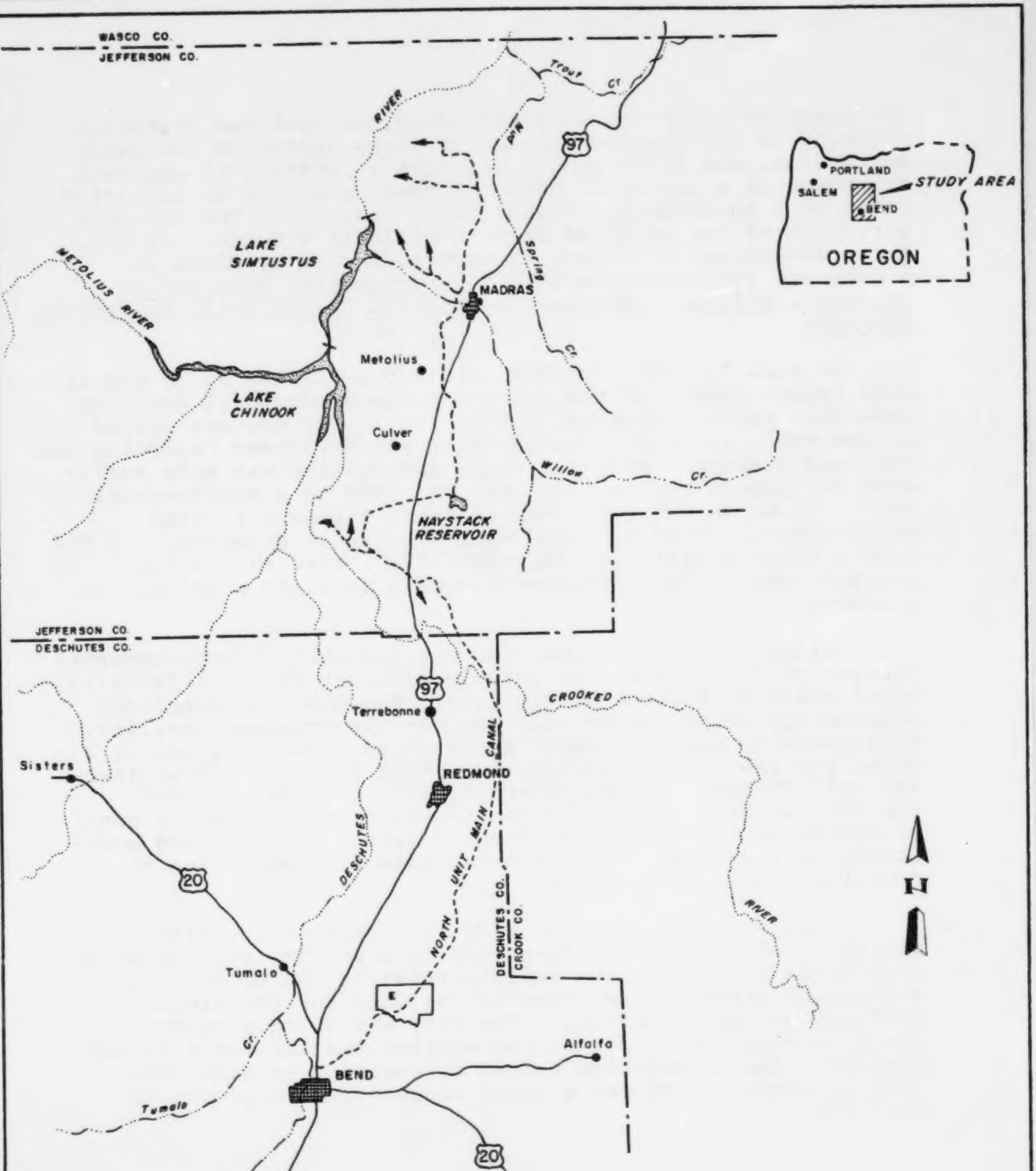

WASCO CO.
JEFFERSON CO.
Trout Cr.
RIVER
97
Spring Cr.
PORTLAND
SALEM
STUDY AREA
BEND
OREGON
LAKE SIMTUSTUS
METOLIUS RIVER
MADRAS
Metolius
LAKE CHINOOK
Culver
Willow Cr.
HAYSTACK RESERVOIR
JEFFERSON CO.
DESCHUTES CO.
97
Terrebonne
CROOKED
Sisters
REDMOND
NORTH UNIT MAIN CANAL
DESCHUTES
20
N
RIVER
DESCHUTES CO.
CROOK CO.
Tumalo
E
Alfalfa
BEND
Tumalo Cr.
20

FIGURE 1-2. THE STUDY AREA

Deschutes River and its major tributaries. Elevations vary from approximately 3,600 feet at Bend to 2,200 feet at Madras. Site E, shown in Figure 1-2, lies northeast of Bend and is the location of the new wastewater treatment plant.

The Bend-Madras area is characterized by a semi-arid climate. Annual rainfall averages 10-12 inches, with the majority falling in winter as rain or snow. Summers are typically hot and dry. Freezing temperatures, however, can occur during any month of the year.

Geologic formations in the study area are primarily of volcanic origin. Lava tubes or caves, formed when molten lava flowed out beneath a cooled and hardened crust, occur throughout the area. Overlying soils are most commonly a sandy loam, and range in depth from several inches to greater than 10 feet.

The major source of surface water in the study area is the Deschutes River and major tributaries, such as the Crooked and Metolius Rivers. During the irrigation season, April through October, almost the entire flow of the Deschutes River is diverted at Bend into six irrigation canal systems, which support crops such as alfalfa, wheat, peppermint and potatoes. Agriculture, including livestock grazing, is the major land use in the study area.

Groundwater is the primary source of drinking water in the study area. The regional water table lies at a depth of 500-600 feet at Bend and between 200-300 feet at Redmond and Madras. Perched groundwater also occurs at various locations. Groundwater flow is believed to travel in a northerly and northwesterly direction (Sceva 1968).

Chapter 2
Effluent Disposal Alternatives

Chapter 2

EFFLUENT DISPOSAL ALTERNATIVES

Projects Evaluated

The purpose of the EIS is to assist the City of Bend in selecting an environmentally-sound and cost-effective solution for the disposal of effluent from the new 6 MGD wastewater treatment plant in accordance with EPA construction grant regulations. This project must be planned to accommodate the City's needs for a 20-year period. A number of effluent disposal options were evaluated for the Bend wastewater treatment plant. This chapter summarizes all alternatives considered by the City's consulting engineers (STR initially and later BECON) and by EPA. Reasons for rejection or acceptance of the various alternatives are also given. Table 2-1 summarizes this information.

STR Alternatives

In the facilities plan developed by Stevens, Thompson and Runyan, Inc. (STR 1976), four options were evaluated for the disposal of effluent from expansion of wastewater treatment facilities at the former treatment plant. These four alternatives are described briefly below.

Year-round Drill Hole Disposal. Under this alternative, effluent would be discharged to drill holes on a continuous basis. The treatment level considered was advanced secondary, using activated sludge followed by clarification and filtration and finally, disinfection using chlorine. Although the facilities plan indicates treatment for nitrogen control as well, the treatment systems finally reported did not include this additional level of treatment.

Combination of Drill Hole and Irrigation Canal Discharge. Effluent disposal would be to the North Unit Main Canal during the summer months and to drill holes during the winter months when the canal was not utilized. Treatment for discharge to the irrigation canal would be secondary treatment followed by chlorine disinfection. Treatment for drill hole disposal would be secondary, followed by filtration and chlorine disinfection.

Combination of Disposal to the Irrigation Canal and Deschutes River. Secondarily treated (activated sludge) and disinfected effluent would be discharged to the North Unit Main Canal during the summer months and to the Deschutes River during the winter months.

Table 2-1. Summary of Effluent Disposal Alternatives Evaluated for the City of Bend and Their Current Status as Ultimate and/or Interim Disposal Methods

EFFLUENT DISCHARGE ALTERNATIVES EVALUATED	FACILITIES PLAN AUTHOR	STATUS AS ULTIMATE SOLUTION	STATUS AS INTERIM SOLUTION
Drill hole - Site C	STR	Rejected due to potential groundwater contamination	NA[1]
Drill hole - NUM Canal	STR	Rejected due to potential groundwater contamination	NA
NUM Canal - Deschutes River	STR	Rejected due to high cost	NA
Spray irrigation - Site C	STR	Rejected due to uncertain reliability	NA
Drill hole - Site E	BECON	Rejected due to potential groundwater contamination	Rejected due to potential groundwater contamination
Infiltration ponds	EPA/BECON	Potentially acceptable in total or as a component of a total system	Conditionally accepted
Deschutes River	EPA	Rejected due to public health risks, impacts on fisheries and high cost	NA
Evaporation ponds	EPA	Rejected due to high cost	NA
Spray irrigation - Site E	BECON	Rejected due to high cost	NA
NUM Canal	EPA	Preferred alternative	Unimplementable due to unresolved institutional and legal restraints
No action		Not acceptable	NA

---

[1] NA - not applicable

Land Application of Effluent by Spray Irrigation. Secondarily treated (activated sludge) and disinfected effluent would be used to irrigate crops at alternate sites on a year-round basis. For this option, three different sites were evaluated as three separate effluent disposal alternatives. No temporary storage reservoir is mentioned as being included in these options. The three sites would be under control of the City.

The STR report recommended land application by spray irrigation on Site C as the most environmentally sound alternative (Figure 2-1). The remaining alternatives were rejected for varying reasons as shown in Table 2-1.

As previously stated, the City retained BECON to implement the facilities plan. After more detailed site evaluation by BECON (Design Definition Memorandum No. 5), Site C was found unsuitable for land application of effluent on the basis of high cost. After relocation of the treatment plant to Site E (Figure 2-1) and further analyses of the land application alternative, BECON recommended that a subsurface effluent disposal method be provided on an interim basis, with a final or ultimate disposal method to be selected at a later date.

Alternatives Evaluated in the Draft EIS

The six effluent disposal options that were considered potentially suitable for the new wastewater treatment plant are evaluated in the EPA Draft EIS, Sewage Effluent Disposal for the City of Bend, Oregon (October 1979). These alternative effluent disposal plans were described by the City's engineer, BECON, and/or by EPA. The Council on Environmental Quality (CEQ) guidelines for EIS preparation authorizes EPA to evaluate in an EIS effluent disposal alternatives offered by the City and alternatives of their own choice. Implementation of one of the alternative projects is, however, the City's responsibility and if EPA grant funds are to be used, the City must apply to EPA for funding.

The Draft EIS alternatives evaluated were:

1. Subsurface disposal via drill holes or fractured rock;
2. Subsurface disposal through the soil mantle;
3. Discharge to the Deschutes River;
4. Discharge to sealed evapotranspiration ponds;
5. Land application by spray irrigation;
6. Discharge to the North Unit Main Canal; and
7. No action to implement a permanent disposal facility.

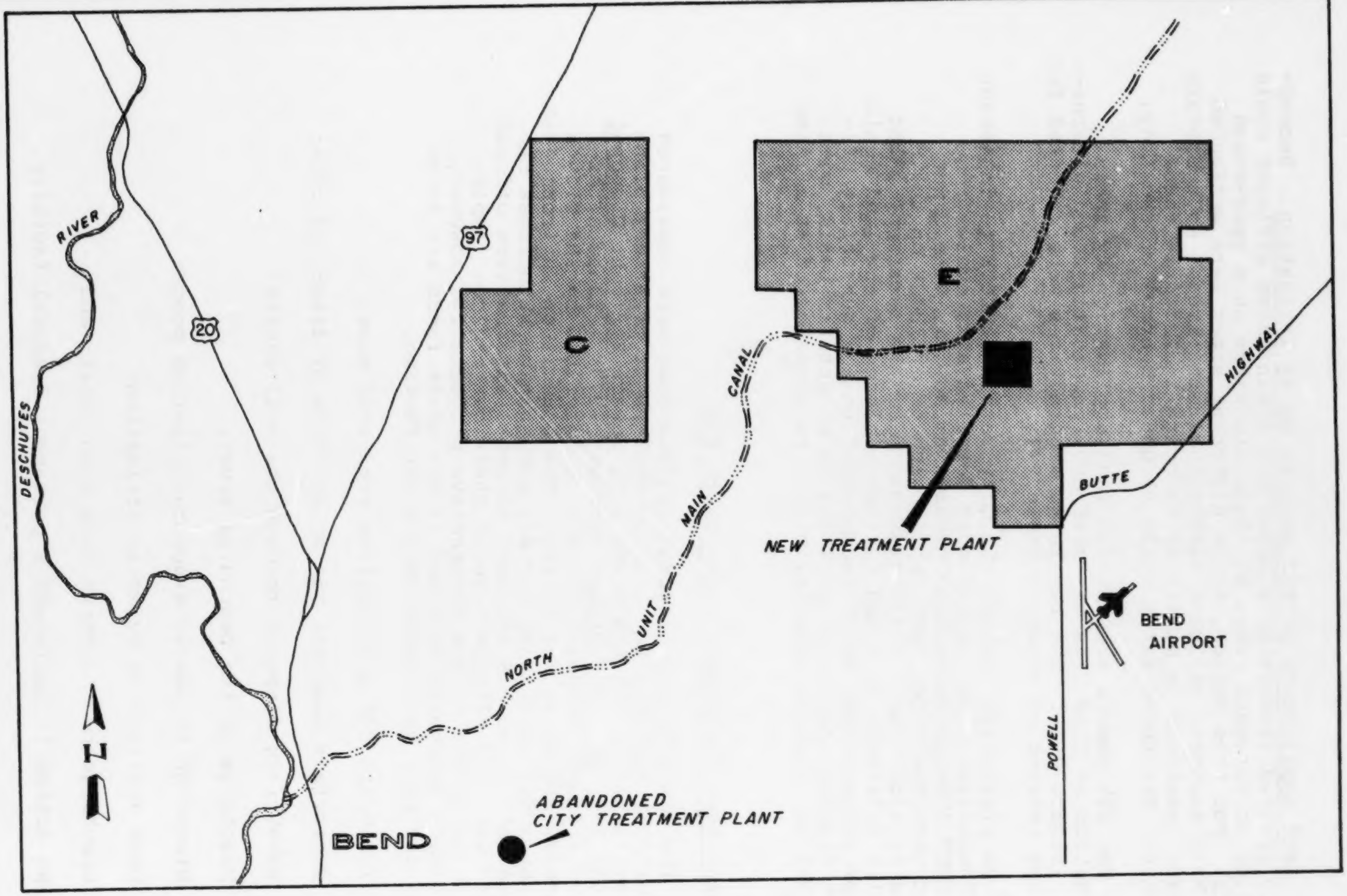

DESCHUTES
RIVER
20
97
C
E
CANAL
MAIN
UNIT
NORTH
NEW TREATMENT PLANT
BUTTE
HIGHWAY
BEND
AIRPORT
POWELL
N
ABANDONED
CITY TREATMENT PLANT
BEND

FIGURE 2-1. TREATMENT PLANT LOCATIONS & PROPOSED EFFLUENT DISPOSAL AREAS (SITES C & E)

Subsurface Disposal via Drill Holes or Fractured Rock. This alternative involved year-round conveyance of effluent by pipeline to a series of drill holes or fractured rock basins on Site E. Effluent would receive secondary treatment, chlorine disinfection, and sand filtration prior to discharge to the disposal basin.

Subsurface Disposal Through The Soil Mantle. This alternative involved year-round conveyance of effluent by pipeline to an 85-acre infiltration pond at a site approximately 2 miles northeast of the new treatment plant. Effluent discharged to the pond would filter through a minimum of 3 feet of soil before entering underlying rock formations.

The infiltration pond alternative presented in the Draft EIS was later modified by BECON. The pond site was moved to a location closer to the new treatment plant and the pond size was expanded to 160 acres.

Discharge to the Deschutes River. Treated wastewater under this alternative would have been pumped through a 6.7 mile pipeline to the Deschutes River on a year-round basis. Effluent would have been discharged downstream of the Bend diversion dam. The treatment system included sand filtration and chlorine disinfection.

Discharge to Sealed Evapotranspiration Ponds. This alternative was considered in the Draft EIS at the request of a local citizen, Mr. Gordon Priday. The Priday alternative involved construction of a series of sealed ponds interconnected by a small canal system. Each pond would have been constructed and managed to establish wildlife habitat. Approximately 1,270 acres of ponds were needed to evaporate the effluent. A 35-acre infiltration pond was included in this alternative as a backup for peak flow and cold season use.

Land Application by Spray Irrigation. Under this alternative, effluent would have received secondary treatment, then would have been pumped to either center-pivot or fixed-head (solid-set) irrigation units for spraying onto the land. Spray irrigation required 1,350 acres to accommodate a treatment plant capacity of 6 mgd. Effluent would have been applied to a cover crop such as reed canary grass, fescue, orchard grass or meadow foxtail.

Discharge to the North Unit Main Canal. This alternative was based on year-round discharge of treated wastewater to the irrigation canal. Because the North Unit Main Canal operates only during the irrigation season, roughly April through October, modifications to year-round canal discharge were included under this alternative. Options considered in combination with summer discharge to the canal were:

1. Discharge to an infiltration pond;
2. Discharge to the Deschutes River; and
3. Discharge to storage reservoirs

No action to Implement a Permanent Disposal Facility. The no-action alternative in this case is the interim 2.5 MGD disposal facility and monitoring program designed to meet two main objectives: 1) receive effluent from initial operations of the new 6 MGD wastewater plant, and 2) provide data that can be used in the design of a 20-year, 6 MGD project. This interim disposal project is the same as the Subsurface Disposal Through the Soil Mantle alternative described above except that the size of the facility needed to take 6 MGD is presently undetermined. The no-action or interim disposal project will provide pilot plant operations data important to the selection of a permanent 20-year project.

Alternative Evaluation Summary

The effluent disposal alternatives listed above were evaluated by the EPA as potential ultimate and/or interim effluent disposal options. Analyses of potential impacts described in Chapter 6 of the Draft EIS (October 1979) led to rejection of several alternatives for reasons shown in Table 2-1. Subsurface Effluent Disposal via Drill Holes or Fractured Rock was rejected as both an ultimate and interim method because of the potential for contamination of groundwater; Discharge to the Deschutes River was rejected due to potential adverse impacts on fisheries resources, public health risks and costs; Discharge to Sealed Evapotranspiration Ponds and Land Application by Spray Irrigation, which both required large acreage, were rejected due to their high cost and usage of large areas of public land. Subsurface Disposal Through the Soil Mantle and Discharge to the North Unit Main Canal were deemed environmentally-sound and cost-effective and therefore, potentially acceptable to EPA as ultimate effluent disposal alternatives.

Subsurface Disposal Through the Soil Mantle has been implemented as an interim effluent disposal project coupled with groundwater monitoring to determine: 1) treatment/disposal effects on subsurface resources and 2) the pond capacity (acreage) needed for long-term (20 years) effluent disposal. Soil infiltration disposal could also be used either as an ultimate solution or in combination with irrigation season discharge to the North Unit Main Canal to provide winter season and emergency effluent disposal.

Reuse of treated effluent is encouraged by federal agencies. Section 201 (d) of the Federal Water Pollution Control Act Amendments states: "The Administrator (EPA) shall encourage waste treatment management which results in the construction of revenue-producing facilities providing for ... the recycling of potential sewage pollutants through the production of agriculture, silviculture, or aquaculture products ...". For this reason, in combination with an evaluation of all other potential impacts, the EPA selects discharge of effluent to the North Unit Main Canal as the environmentally preferred alternative. The effluent can be considered a long-term water resource of considerable value in an agricultural area where water can often be in short supply. EPA encourages the City of Bend to take further steps toward negotiating an agreement with the North Unit Irrigation District for use of treated effluent in agricultural irrigation. In addition, the City should encourage farmers and ranchers in the vicinity of the treatment plant to seasonally use the reclaimed wastewater. Holding ponds could be provided for this type of use.

Chapter 3

Alternatives Acceptable to EPA

Chapter 3

ALTERNATIVES ACCEPTABLE TO EPA

Introduction

The environmental impact analysis reported in the Draft EIS, coupled with comments submitted at the EPA public hearing and by letter, causes the EPA to find two methods of effluent disposal environmentally acceptable and cost-effective for EPA grant funding: 1) discharge to the North Unit Main Canal for reuse in crop irrigation, and 2) evaporation and infiltration through the soil mantle. Evaporation/infiltration can be coupled with a system providing storage and conveyance to nearby farmers and ranchers for agricultural reuse. These effluent disposal methods may be used in combination to provide year-round and/or emergency services. If EPA grants are to be offered, the City of Bend must apply to EPA for funds to implement an environmentally acceptable and cost-effective effluent disposal project. The implementation of either or both options as the permanent (20-year) disposal project is presently held in abeyance until certain technical and institutional matters are resolved. These issues, which are discussed in detail in the following sections, should be resolved before September 1982.

Discharge to the North Unit Main Canal

Alternative Description

This alternative is based on year-round discharge of treated wastewater to the irrigation canal. Due to the location of the treatment plant, which is scheduled for start-up in late 1980, and the principal use of canal water for irrigation, the North Unit Main Canal was considered more appropriate for effluent disposal than other canal systems in the Bend area. Effluent would undergo secondary treatment followed by chlorine disinfection and filtration prior to discharge.

The effluent would be pumped through a short forcemain and discharged directly to the canal. The effluent flow rate would average approximately 9 cubic feet per second (cfs) at full use of the plant.

Because the North Unit Main Canal operates only during the irrigation season, roughly April through October, a modification to year-round canal discharge or provisions for storage would need to be included under this alternative.

Impacts of Canal Effluent Discharge and Feasible Mitigation Measures

Short-term and long-term impacts of effluent disposal to the North Unit Main Canal were addressed in the Draft EIS (October 1979). Table 3-1 summarizes the impacts and potential mitigation measures. Potential adverse impacts relate to: 1) public health risks to Madras residents that use canal water for domestic purposes in summer, 2) increased aquatic plant growth in the canal, and 3) addition of nutrients to Haystack Reservoir that may affect eutrophication rates. Mitigation measures for public health risks include the construction of water wells for the City of Madras, monitoring of water quality at the Madras water treatment plant, and acceptance of liability by the City of Bend for potential public health hazards. To mitigate increases in aquatic plant growth in the canal, the City of Bend could pay increased maintenance costs to the irrigation district, or the treatment process could be upgraded to remove nuisance nutrients. Accelerated eutrophication of Haystack Reservoir also could be mitigated by upgrading the treatment process, or by selectively scheduling the filling of the reservoir.

Impacts associated with winter discharge to the canal, such as ice-buildups, potential groundwater contamination and interference with canal maintenance schedules, could be avoided by discharging effluent to infiltration ponds during the nonirrigation season.

In comparison to other alternatives evaluated in the Draft EIS, the impacts associated with effluent disposal to the North Unit Main Canal can be considered as trade-offs. For example, discharge of effluent to the canal vs. effluent discharge to the subsurface lessens the potential for significant groundwater impacts. Large acreage needs and high costs of disposal are avoided by chosing canal discharge over spray irrigation or discharge to sealed evaporation ponds. Canal discharge vs. discharge to the Deschutes River avoids adverse impacts to the fishery, domestic water users, and the City of Redmond, which also uses Deschutes River water for domestic uses.

Table 3-1. Impacts Associated with Discharge of Effluent to the North Unit Main Canal and Potential Mitigation Measures

Impact Category	Impact Description	Potential Mitigation Measure
Groundwater	Effluent discharged in winter is not expected to proceed a great distance down the canal before entering the ground. There would be a risk of groundwater contamination of shallow aquifers near the canal.	Discharge of effluent to storage or infiltration ponds in winter. Explore subsurface conditions; monitor effluent flow in subsurface.
Surface Waters	Increased nutrient input to canal could cause added eutrophic conditions in Haystack Reservoir.	Add treatment processes to remove nutrients. Selectively schedule reservoir filling.
Public Health	Potential health risk to residents of Madras using canal water for domestic purposes in summer.	Monitor water quality in Madras water treatment plant; construct new water wells for summer use.
Fisheries	Chlorine concentrations in the canal system could adversely impact fish in the canal and Haystack Reservoir.	Dechlorination of effluent at the treatment plant.
	Eutrophication of Haystack Reservoir could reduce dissolved oxygen concentrations.	Add treatment processes to remove nutrients. Aerate reservoir.
Aesthetics	Adverse visual impact of increased aquatic plant growth and algae in canal and reservoir.	Add treatment processes to remove nutrients. Implement chemical treatment and mechanical harvesting.
Secondary Costs	Increased maintenance costs to control increased aquatic plant growth.	City of Bend pays increased maintenance costs.
	Potential ice buildups due to winter flow in canal; structural maintenance costs.	Discharge of effluent to storage or infiltration ponds in winter; City of Bend pay increased maintenance costs.
	Liability insurance costs.	City of Bend assumes liability associated with effluent disposal.
	Potential secondary economic impact on resorts at Haystack Reservoir due to increased eutrophication.	Add treatment processes to remove nutrients. Use alternative methods of operations.

Implementation Problems

Although discharge of effluent to the North Unit Main Canal is an environmentally acceptable alternative to the EPA, this alternative is not implementable at this time because it is not acceptable to the managers and customers of the irrigation district. Moreover, the City of Bend has not applied to EPA, DEQ, and the North Unit Irrigation District to implement this disposal option. The North Unit Irrigation District has outlined the following major institutional and legal constraints on acceptance of effluent discharged to the canal during the irrigation season:

1. The addition of effluent nutrients (i.e., nitrogen and phosphorus) to the canal could result in increased aquatic plant growth thereby requiring the district to increase the use of herbicides in their maintenance program.
2. Effluent flow in the canal in winter would interfere with canal maintenance normally scheduled during the winter months when the canal is dry.
3. Effluent flow in the canal in winter could cause ice buildups that could damage canal structure.
4. Present easements allow water to flow in the canal through private property only during the irrigation season (April through October). Property might have to be condemned to allow effluent to flow through the canal in winter.
5. Undiluted effluent flow in the canal outside the irrigation season could contaminate groundwater.
6. Liability insurance would be required to protect the North Unit Irrigation District against claims regarding diseases contracted by people coming in contact with canal water containing effluent. Setting limits on liability insurance would be difficult under present law.
7. There is a potential for adverse psychological effects regarding use of effluent on food crops grown in the irrigation district.

As stated previously, discharge of effluent to the North Unit Main Canal is considered to be an environmentally acceptable alternative to EPA. The EPA urges the City of Bend to continue negotiations with the North Unit Irrigation District to resolve present legal and institutional constraints. This alternative could be implemented only if the City successfully negotiates an agreement with the irrigation district to discharge effluent into the canal. The interim effluent disposal alternative presently under construction has the potential for solving some of the implementation problems associated with discharge to the canal. This topic is discussed in Chapter 1.

Evaporation and Infiltration Through the Soil Mantle

Introduction

The evaporation/infiltration pond alternative described in the Draft EIS (October 1979) involved piping effluent approximately 2 miles northeast of the new treatment plant to an 85-acre natural depression. Subsequent revisions of the Draft EIS alternative prepared by BECON in consultation with the EPA and BLM resulted in relocation of the evaporation/infiltration pond to a site less than 1 mile east of the treatment plant. The size of the pond also was increased to 160 acres due to possible differences in soil percolation rates between the two pond sites.

The revised evaporation/infiltration pond alternative was selected by the City of Bend for interim effluent disposal and subsequently funded by EPA. Infiltration of effluent through the soil mantle provides additional soils treatment and may achieve best practicable wastewater treatment (BPWT) objectives of EPA. For this reason, infiltration is reviewed favorably by the EPA as the interim disposal alternative and, therefore, may become a part of the permanent disposal facility. The EPA, however, is concerned about the long-term environmental consequences of this alternative and will require further evaluation of the interim disposal facility before determining its potential use as part of the permanent disposal facility. Operation of the interim facility will also provide data to determine the size of infiltration ponds necessary to accommodate a 6 MGD flow. To implement this alternative as a permanent disposal facility, the City of Bend must apply to the EPA for appropriate grant funding.

The following sections describe: 1) the process by which infiltration was selected as the interim disposal method, 2) the design of the disposal facilities, and 3) impacts and mitigation measures associated with this alternative.

Alternatives Evaluated

In Design Definition Memorandum No. 11, BECON (1979) evaluated six interim effluent disposal alternatives. These were:

A. Subsurface disposal to basalts above pumice deposits;

B. Subsurface disposal to a void zone at the 215-240 foot depth;

C. Subsurface disposal to artificially fractured basalts beneath the pumice deposit;

D. Surface infiltration - evaporation through the existing soil mantle with overflow to adjacent basins;

E. Combined surface infiltration through the soil mantle and subsurface percolation through fractured basalt;

F. Surface infiltration - overflow pond and centralized overflow percolation zone through fractured basalt.

These alternatives are described in greater detail in Appendix A, Chapter 8 (June 9, 1980 Finding of No Significant Impact).

After several meetings between the City and EPA, the EPA selected a modified version of BECON Alternative F for implementation as an interim project. This project, which is similar to the infiltration pond alternative presented in the Draft EIS (October 1979), is described below.

Infiltration Pond

The infiltration pond will receive secondarily treated and disinfected effluent from the new wastewater treatment plant. The pond will be located within a 470-acre tract of land northeast of the treatment plant (Figure 3-1). The infiltration pond will be approximately 160 acres and be developed by diking lower boundaries of a natural depression. At maximum capacity, the pond will have a maximum depth of approximately 25 feet with an average depth between 10-12 feet. Its disposal capacity is estimated to be 2.5 MGD.

Figure 3-2 shows the proposed design for the infiltration pond. Construction of the pond will require 5,000 linear feet of dike, utilizing approximately 60,000 cubic yards of soil

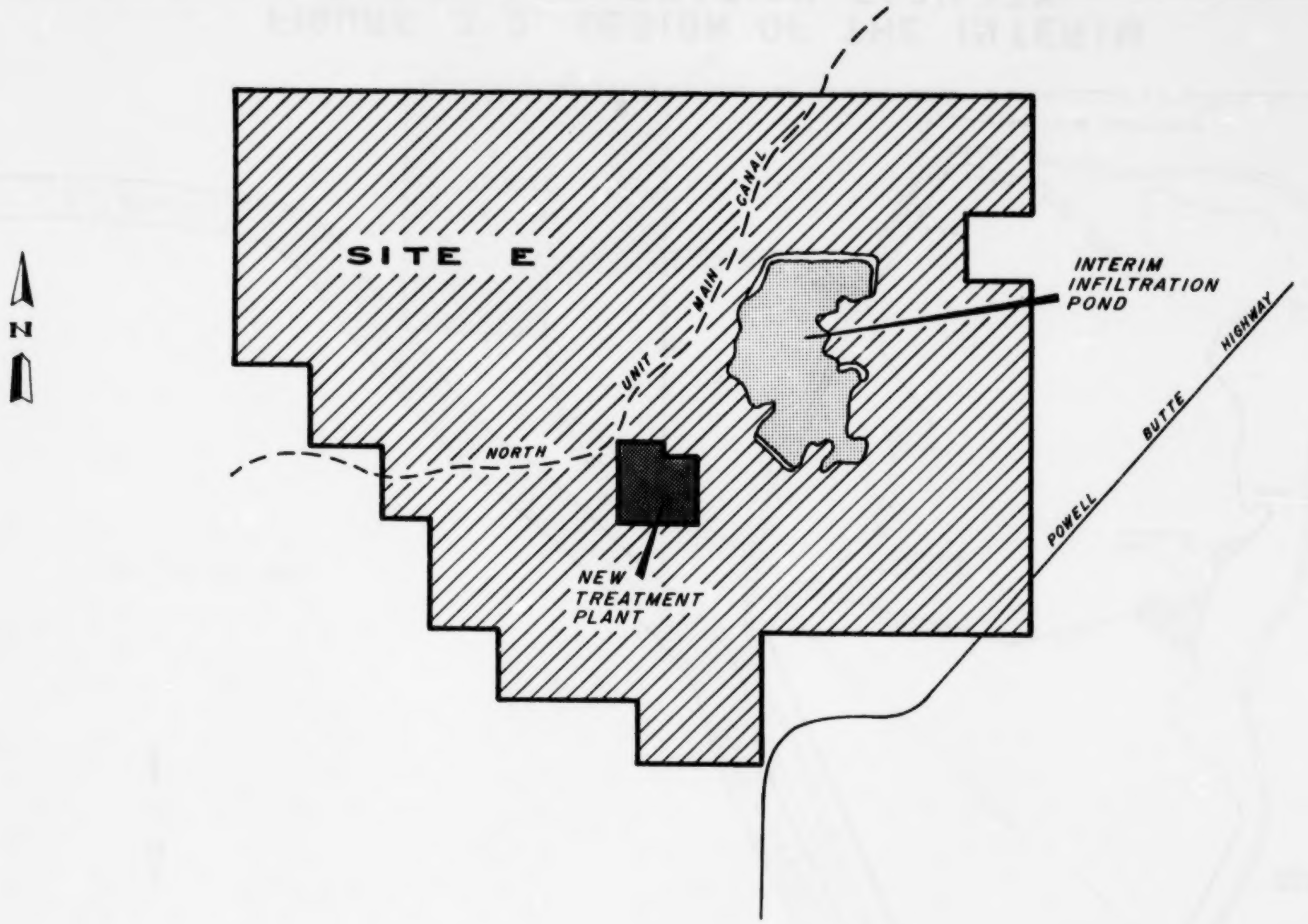
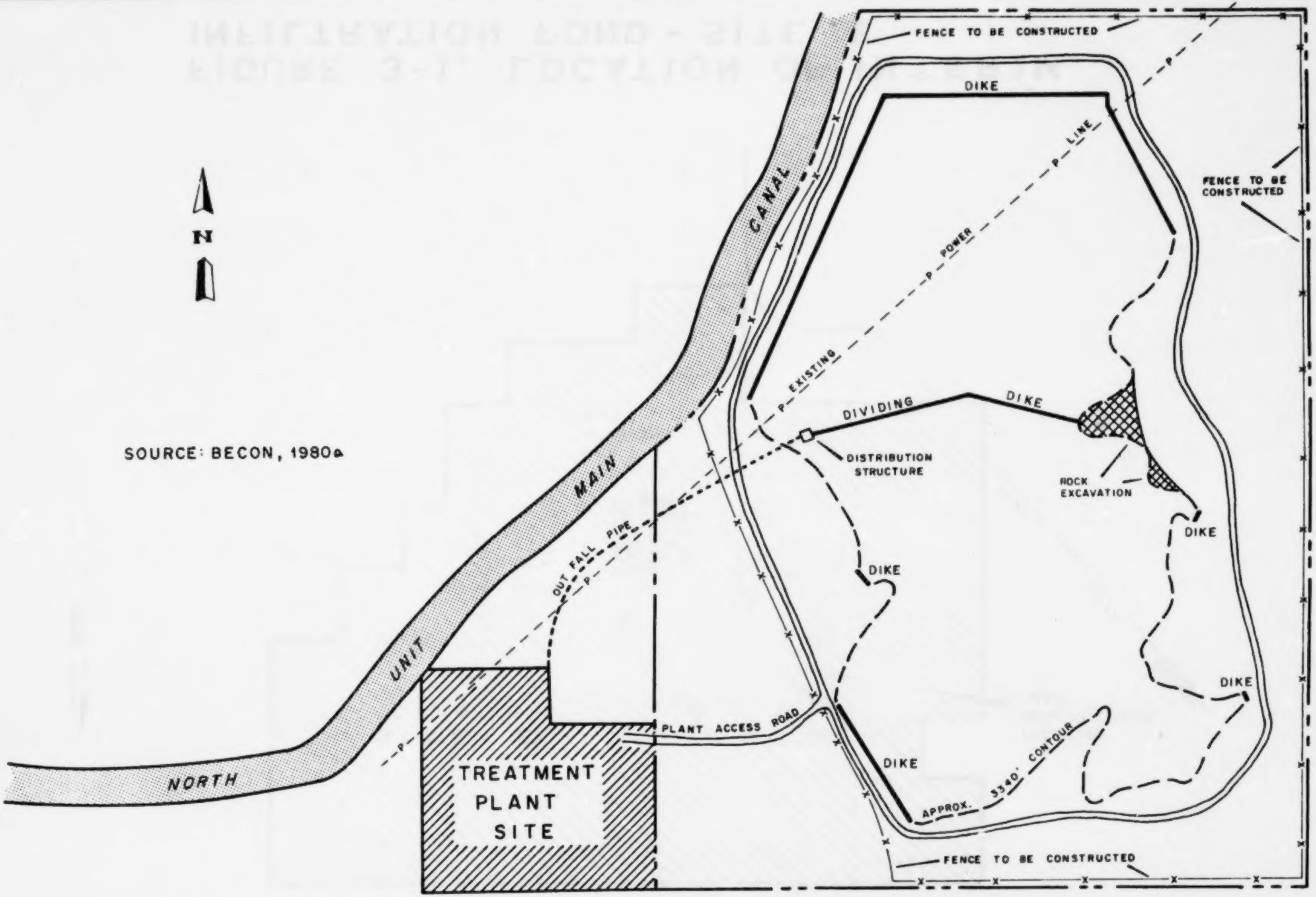

SITE E
N
NORTH UNIT MAIN CANAL
INTERIM INFILTRATION POND
NEW TREATMENT PLANT
POWELL BUTTE HIGHWAY

FIGURE 3-1. LOCATION OF INTERIM INFILTRATION POND - SITE E


N
CANAL
MAIN
UNIT
NORTH
FENCE TO BE CONSTRUCTED
FENCE TO BE CONSTRUCTED
FENCE TO BE CONSTRUCTED
DIKE
P LINE
P POWER
P EXISTING
DIVIDING DIKE
DISTRIBUTION STRUCTURE
ROCK EXCAVATION
DIKE
DIKE
DIKE
DIKE
APPROX. 3340' CONTOUR
OUT FALL PIPE
PLANT ACCESS ROAD
TREATMENT PLANT SITE

SOURCE: BECON, 1980a

FIGURE 3-2. DESIGN OF THE INTERIM EFFLUENT INFILTRATION FACILITY

that will be excavated from the pond site. Remaining soils for percolation will be a minimum of 3-5 feet. The dikes will be a maximum height of 15 feet, tapering to zero, as necessary dike height is matched with existing topography. The dikes will be 10 feet wide at the top with 2:1 side slopes riprapped with rock excavated or blasted from the pond site (BECON 1980b). Dikes will be constructed with an impermeable core to prevent effluent seeps. The infiltration pond will be divided into several alternate basins or cells for intermittent flooding and drying, and for maintenance purposes. Such provisions will assure that natural sealing of the pond bottom is prevented.

During design of the infiltration pond facility, potential leakage areas (fractured basalt in the pond bottom) will be identified and an appraisal made of their likelihood for excessive leakage. Those areas judged to be highly susceptible to seepage will be sealed. Other potential leakage sources will be identified and monitored during operation of the facility and inspected during maintenance periods.

The pond area will be cleared of trees, brush and any other vegetative matter. This material will be removed from the site and disposed of. The top 6 inches of soil will be scarified to improve percolation. The buffer area surrounding the infiltration pond will be left in its existing natural state.

The outfall line from the wastewater treatment plant, which will follow natural contours, will convey effluent by gravity to the outfall structure in the infiltration pond. The outfall line will either be an open channel or a buried pipeline, depending on final design.

For maintenance, a road will be constructed around the pond perimeter. The road will be approximately 12-14 feet wide and will be graded and surfaced with cinders.

A 4-strand barbed wire fence will be constructed around the 470-acre lease area. Maintenance access will be provided at McGrath Road and at fence corners.

A Pacific Power and Light Company transmission line (69kv), which currently crosses through the infiltration pond site, will be relocated so that it will extend along the northwesterly and northerly side of the pond.

It is estimated that construction of the infiltration pond will be completed in January 1981 (Carnahan pers. comm.).

Infiltration Pond Maintenance

Maintenance of the infiltration pond and surrounding lease area will be provided by the City of Bend, under direct supervision of the wastewater treatment plant superintendent. The lease area will be inspected a minimum of three times per week by plant operating personnel. Any necessary maintenance services will be provided by these personnel or by the City Maintenance Department.

During tri-weekly inspections, dikes will be inspected for integrity and potential erosion. The outfall line will be inspected for any blockages to effluent flow.

The maintenance road will be graded periodically to assure adequate access to the lease areas. Fences will be repaired as necessary.

The power transmission line will be maintained by the Pacific Power and Light Company as part of their regular program of surveillance and upkeep.

Infiltration Pond - Percolation Rates

To size the infiltration pond and determine acceptable effluent application rates, BECON (1979) performed percolation tests on Site "E" basin soils. A percolation test was conducted on a 1-acre plot in the area where the infiltration pond will be located. Water from the North Unit Main Canal was pumped to the 1-acre pond continuously for 5 days to allow a reasonable degree of soil saturation before any measurements were made. Based on this test, a percolation rate of 100 gallons per minute (gpm) of clear water per acre was established. The effluent application rate was then calculated to 0.30 gpd/ft^2 on the basis of criteria for septic system design (BECON 1980a). The value 0.30 gpd/ft^2 corresponds to an effluent percolation rate of approximately .44 feet per day.

Soil types within the infiltration pond were sampled by BECON (1980a) and found to vary with depth. Silty sands and medium-to-fine sands were encountered to depths of 9 feet. Clay soils as thick as 6 feet were found approximately 6 feet below the surface at the center of the Site E basin. Soils ranged in depth from approximately 4-15 feet within the basin (BECON 1979). According to BECON (1980a), soils encountered within the infiltration basin are of adequate grain size, cellular nature and thickness to provide effective percolation rates.

Groundwater Monitoring Program

A groundwater monitoring system was developed by BECON (1980b) to accomplish several goals:

1. To establish a data base for comparison purposes in the future;
2. To track effluent migration below the site; and
3. To compare groundwater quality below the infiltration pond site with established drinking water standards.

To establish background water quality prior to effluent disposal, a number of constituents of groundwater that are most closely associated with effluent will be measured at periodic intervals. These constituents and their sampling frequency are shown in Table 3-2. Data will be analyzed on a continuous basis and the program revised where needed. Background water quality sampling began in existing wells in February 1980 and will be continued through March 1981.

To monitor effluent migration as well as water quality below the infiltration site, a monitoring well system will be sequentially constructed around the disposal site. Initially, five monitoring wells will be constructed. Each well will be ten inches in diameter and totally encased. Two wells will be drilled to a depth of approximately 600 feet and the remaining three to a depth of approximately 75 feet. Additional wells will be drilled to varying depths after the infiltration pond is in operation and an estimate of subterranean migration can be made. The approximate locations of monitoring wells are shown in Figure 3-3. Included are existing domestic wells for which historic data are available, additional domestic wells with no historic quality data and two wells to be constructed specifically for monitoring purposes.

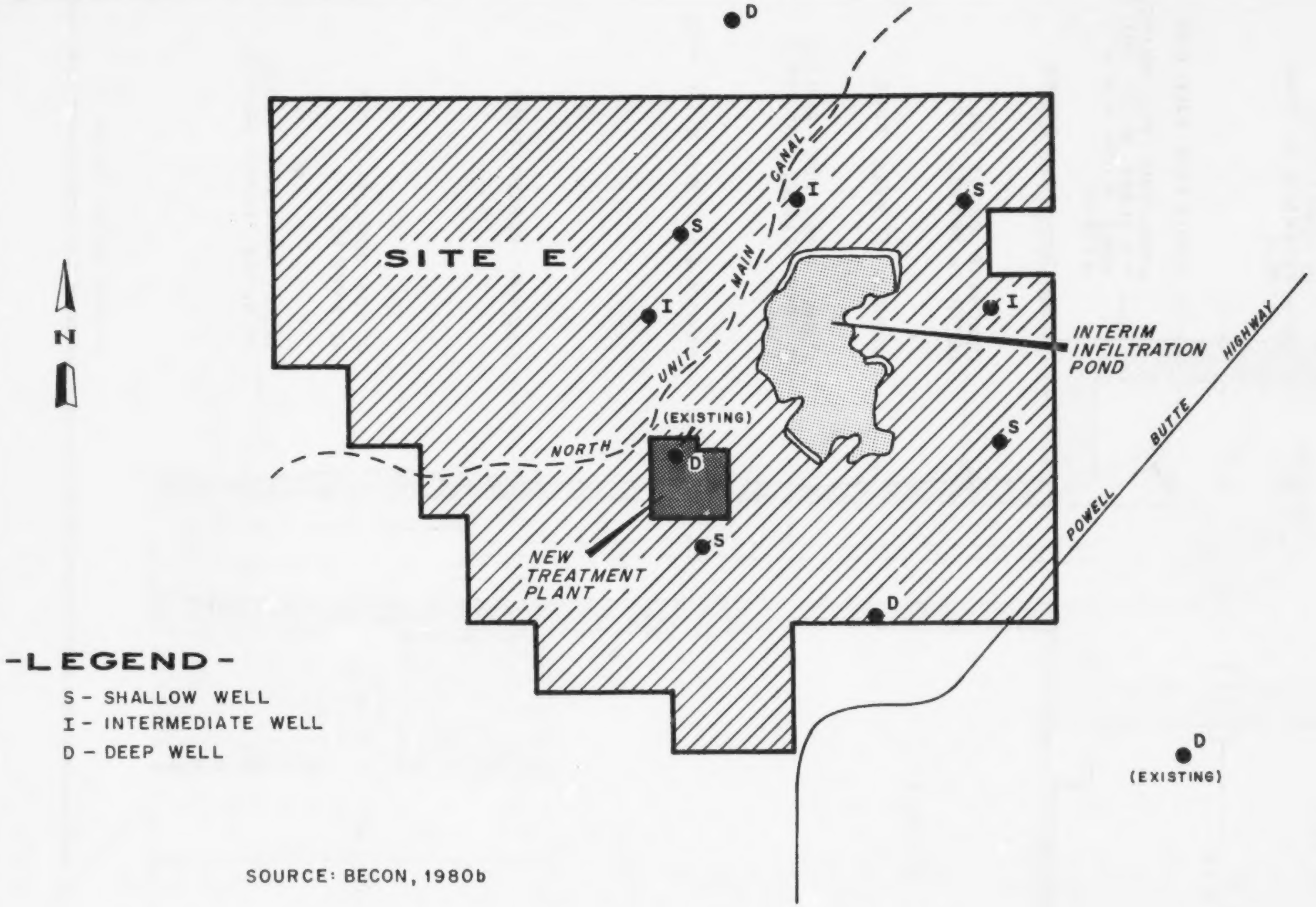
Figures 3-4, 3-5 and 3-6 show the cross-section of a typical deep (±500 feet) well, intermediate (±250 feet) well and shallow (±75 feet) well. Deep wells will be drilled into the water table and will have submersible pumps installed for water quality sampling. Intermediate wells will penetrate the cavernous zone. Shallow wells will extend only into the pumice/ash bed layer. Intermediate and shallow wells will act as "dry wells" used to monitor any subterranean effluent flow. If flow is discovered in a dry well, a pump will be lowered into the well for sampling.

Monitoring wells will not be supplied with permanent electrical power connection; a portable generator will be used to operate the pumps for sampling purposes. The surface apparatus for each well will be covered by a concrete box attached to a concrete slab and covered with a locked lid. Perpetual maintenance will be provided for all monitoring wells (BECON 1980b).

Table 3-2. Groundwater Constituents and Their Proposed Sampling Frequency - Background Monitoring Program

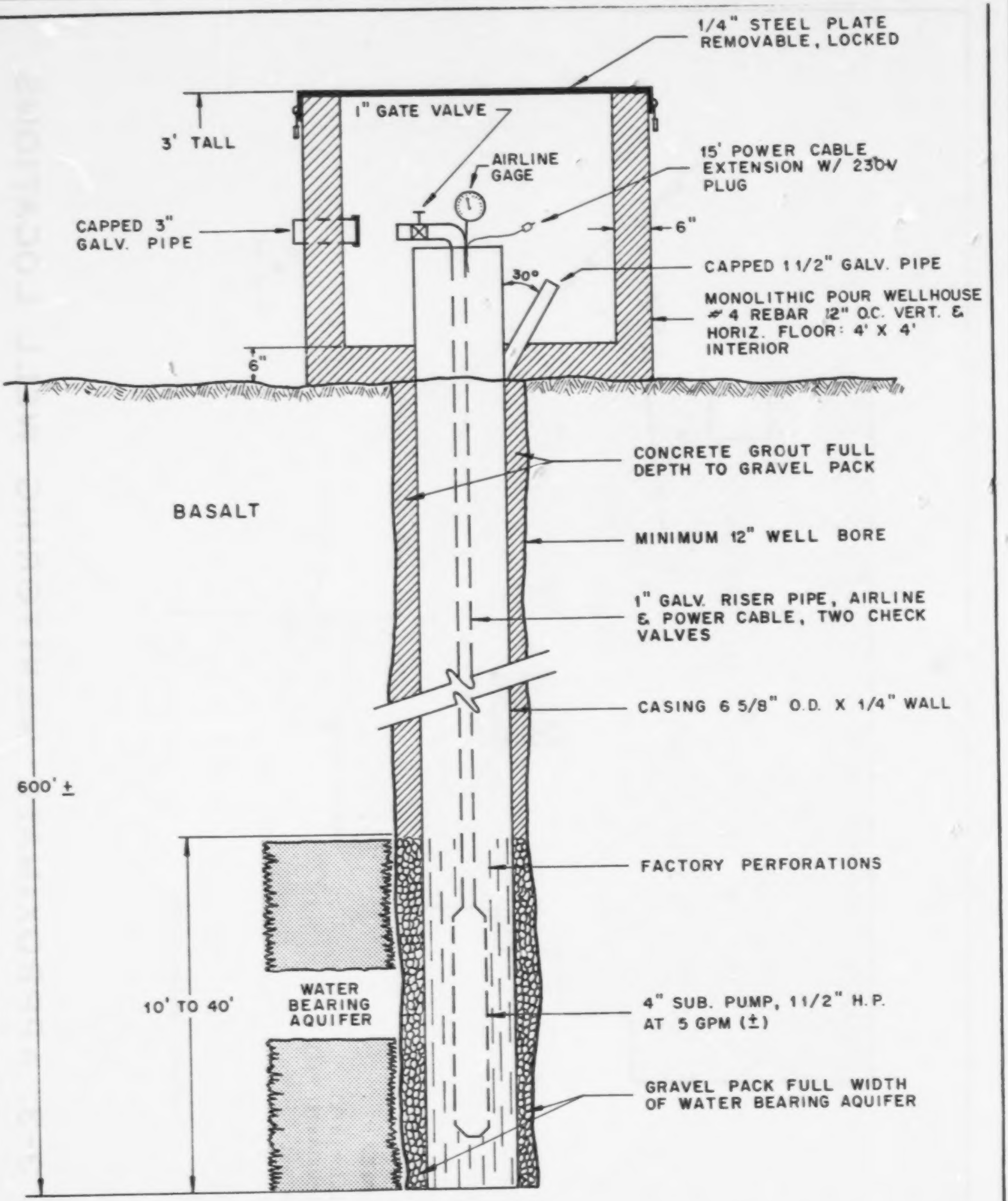
CONSTITUENT	1980 SAMPLING FREQUENCY	1981 SAMPLING FREQUENCY
pH	2/month	2/month
Temperature		
Total Coliform		
Fecal Coliform		
BOD_5		
Total Solids		
Volatile Solids		
Total P		
$O\text{-}PO_4$		
$NO_3\text{-}N$		
$NH_3\text{-}N$		
Conductance		
Alkalinity	1/month	1/2 months
Ca		
Cl		
Cu		
Fl		
Hardness	1/month	1/2 months
Fe		
Mn		
Mg		
Si		
Na		
SO_4		
Zn		
Arsenic	1/3 months	3/year
Barium		
Cadmium		
Chromium		
Lead		
Mercury		
Selenium		
Silver		
Lindane		
Methoxychlor		
2,4-D		
Toxaphene	1/3 months	3/year
Endrin		
2,4,5,TP (Silvex)		

SOURCE: BECON, February 29, 1980 letter to DEQ.


D
SITE E
S
I
CANAL
MAIN
UNIT
NORTH
S
I
(EXISTING)
D
NEW
TREATMENT
PLANT
S
INTERIM
INFILTRATION
POND
I
S
D
POWELL
BUTTE
HIGHWAY
D
(EXISTING)
N
-LEGEND-
S - SHALLOW WELL
I - INTERMEDIATE WELL
D - DEEP WELL

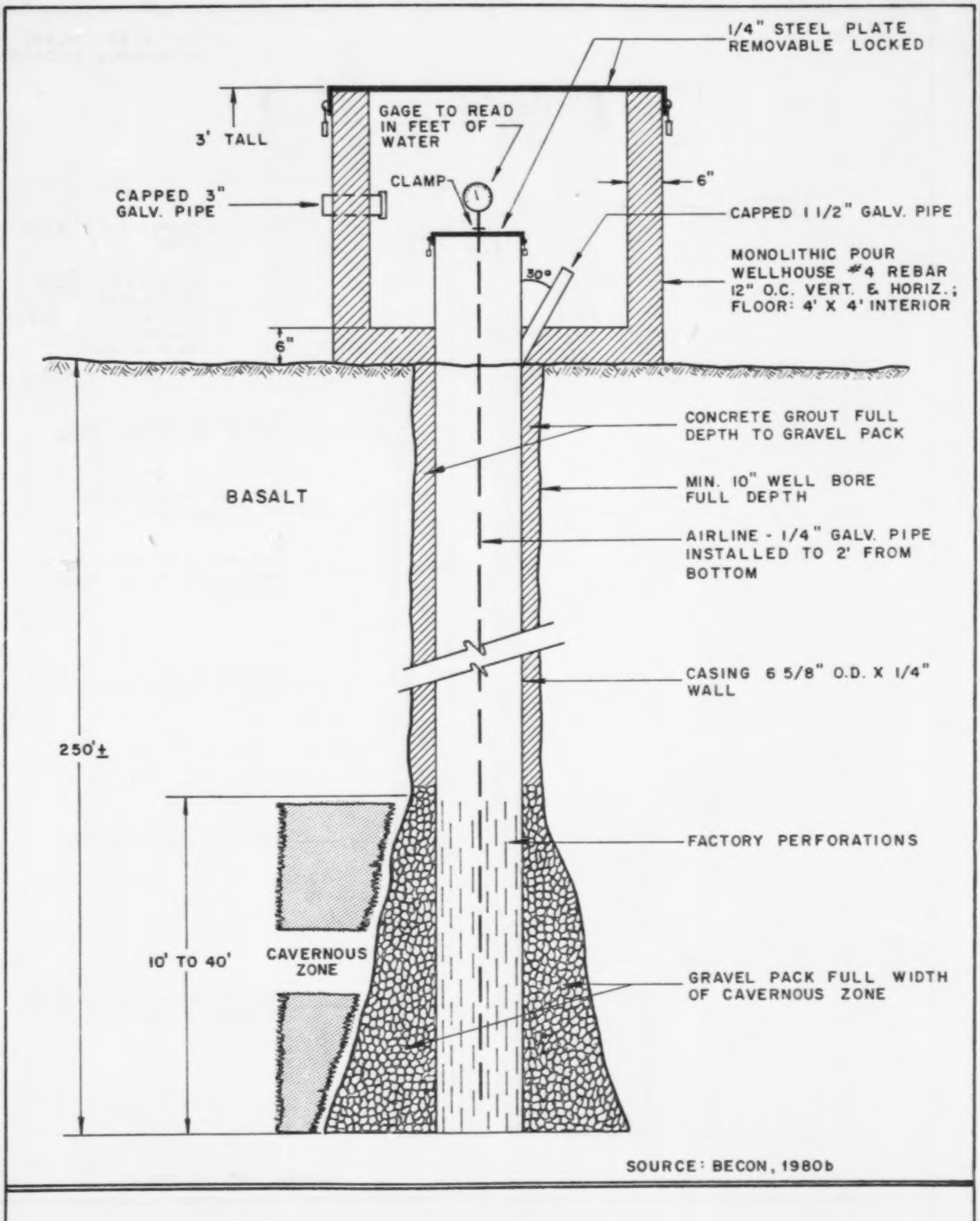
SOURCE: BECON, 1980b

FIGURE 3-3. APPROXIMATE MONITORING WELL LOCATIONS


1/4" STEEL PLATE REMOVABLE, LOCKED
3' TALL
1" GATE VALVE
AIRLINE GAGE
15' POWER CABLE EXTENSION W/ 230V PLUG
CAPPED 3" GALV. PIPE
6"
30°
CAPPED 1 1/2" GALV. PIPE
MONOLITHIC POUR WELLHOUSE #4 REBAR 12" O.C. VERT. & HORIZ. FLOOR: 4' X 4' INTERIOR
6"
CONCRETE GROUT FULL DEPTH TO GRAVEL PACK
BASALT
MINIMUM 12" WELL BORE
1" GALV. RISER PIPE, AIRLINE & POWER CABLE, TWO CHECK VALVES
CASING 6 5/8" O.D. X 1/4" WALL
600' ±
FACTORY PERFORATIONS
10' TO 40'
WATER BEARING AQUIFER
4" SUB. PUMP, 1 1/2" H.P. AT 5 GPM (±)
GRAVEL PACK FULL WIDTH OF WATER BEARING AQUIFER

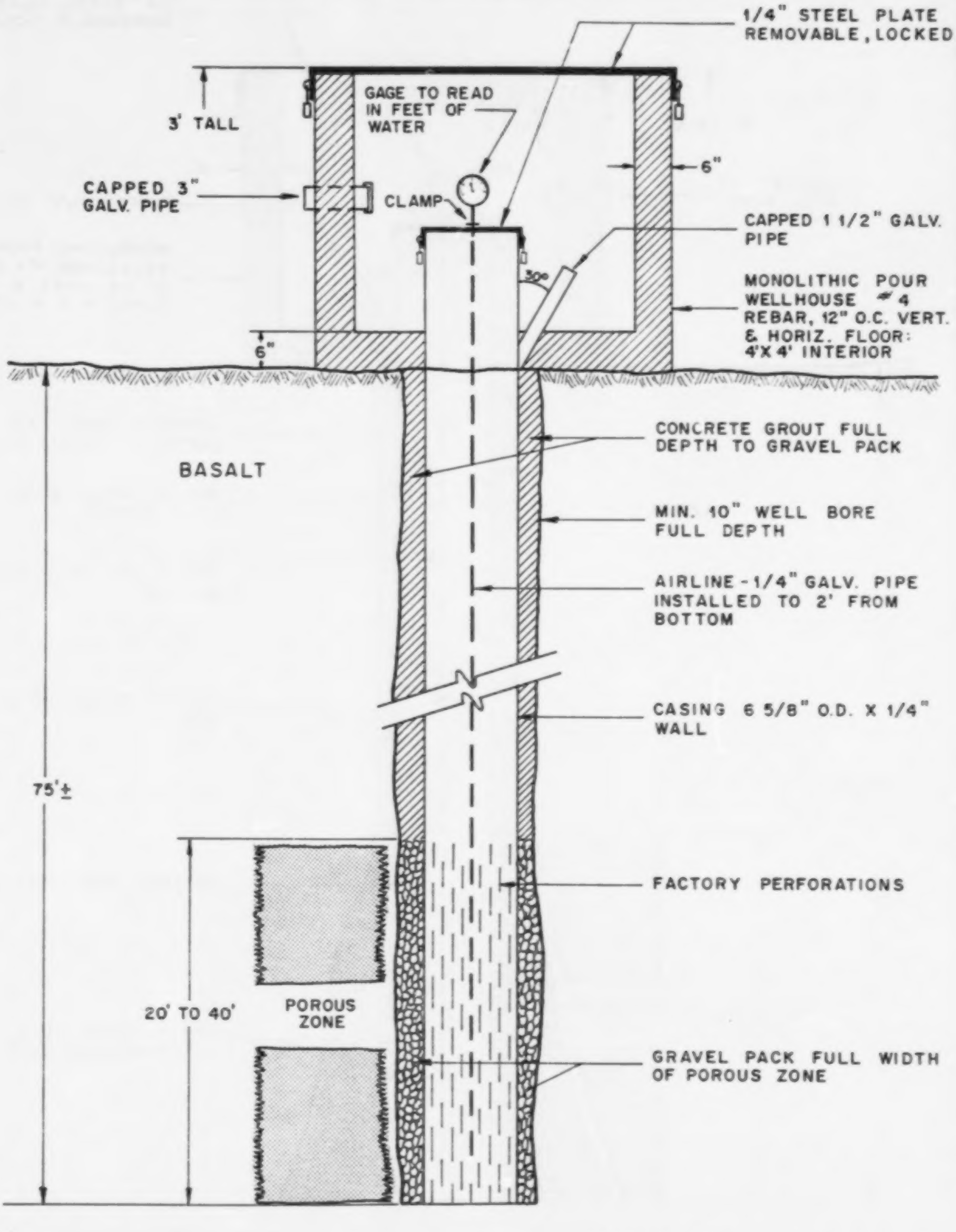
SOURCE: BECON, 1980b

FIGURE 3-4. TYPICAL DEEP MONITORING WELL


1/4" STEEL PLATE REMOVABLE LOCKED
3' TALL
GAGE TO READ IN FEET OF WATER
CLAMP
6"
CAPPED 3" GALV. PIPE
CAPPED 1 1/2" GALV. PIPE
MONOLITHIC POUR WELLHOUSE #4 REBAR 12" O.C. VERT. & HORIZ.; FLOOR: 4' X 4' INTERIOR
30°
6"
CONCRETE GROUT FULL DEPTH TO GRAVEL PACK
MIN. 10" WELL BORE FULL DEPTH
BASALT
AIRLINE - 1/4" GALV. PIPE INSTALLED TO 2' FROM BOTTOM
CASING 6 5/8" O.D. X 1/4" WALL
250'±
FACTORY PERFORATIONS
10' TO 40'
CAVERNOUS ZONE
GRAVEL PACK FULL WIDTH OF CAVERNOUS ZONE

SOURCE: BECON, 1980b

FIGURE 3-5. TYPICAL INTERMEDIATE MONITORING WELL


1/4" STEEL PLATE REMOVABLE, LOCKED
GAGE TO READ IN FEET OF WATER
3' TALL
6"
CAPPED 3" GALV. PIPE
CLAMP
CAPPED 1 1/2" GALV. PIPE
30°
MONOLITHIC POUR WELLHOUSE #4 REBAR, 12" O.C. VERT. & HORIZ. FLOOR: 4'X 4' INTERIOR
6"
CONCRETE GROUT FULL DEPTH TO GRAVEL PACK
BASALT
MIN. 10" WELL BORE FULL DEPTH
AIRLINE - 1/4" GALV. PIPE INSTALLED TO 2' FROM BOTTOM
CASING 6 5/8" O.D. X 1/4" WALL
75'±
FACTORY PERFORATIONS
20' TO 40'
POROUS ZONE
GRAVEL PACK FULL WIDTH OF POROUS ZONE

SOURCE: BECON, 1980b

FIGURE 3-6. TYPICAL SHALLOW MONITORING WELL

Drilling and well installation operations are anticipated to begin in November or December 1980. Water samples from deep wells will provide additional site-specific baseline data for existing groundwater conditions, to be included in the groundwater data collection program initiated in February 1980.

Monitoring wells will be located near existing roads, whenever possible, to minimize the need to construct access roads.

Management of the monitoring well system will be the responsibility of the City of Bend as part of the wastewater collection and treatment facilities.

Impacts of Infiltration Pond Disposal and Mitigation Measures

Short-term and long-term impacts of effluent disposal to infiltration ponds were addressed in the Draft EIS (October 1979). Table 3-3 summarizes major adverse impacts and potential mitigation measures. The adverse impact of greatest significance is potential groundwater contamination and the associated public health risk. Soils encountered by BECON (1980a) on the infiltration pond site, however, are judged to have good pollutant removal qualities. Grain size, fines content and thickness are adequate to provide substantial surface area for percolation. The cellular nature of volcanic or pumice materials found in the soils will also provide additional surface area for effluent contact, further increasing pollutant removal.

Soil infiltration-percolation studies have shown high removal efficiencies for pollutants such as BOD, suspended solids, viruses and bacteria. Removal efficiencies of other pollutants such as nitrogen, phosphorus and stable organic compounds, however, vary considerably with soil characteristics and management practices (Pound and Crites 1973). Actual pollutant removal efficiencies for soils within the infiltration pond should be determined through the proposed effluent and groundwater monitoring program. Using adequate monitoring data, a confirmed rate of transfer of substances from the effluent to groundwater can be calculated.

Adverse impacts associated with effluent discharge to infiltration ponds would be lessened by combining winter and emergency use of this alternative with summer discharge of effluent to the North Unit Main Canal. Effluent flow to the infiltration ponds would be approximately 870 million gallons annually, or 40 percent of the total effluent discharged per year.

Table 3-3. Impacts Associated With Discharge of Effluent to Infiltration Ponds and Potential Mitigation Measures

Impact Category	Impact Description	Potential Mitigation Measure
Groundwater	Some effluent contaminants may not be filtered out in soil mantle and therefore may reach groundwater supplies.	Monitor groundwater below infiltration site; upgrade treatment process or apply source control and pretreatment measures.
Public Health	Potential health risk to residents using groundwater supplies for domestic uses.	Monitor groundwater below infiltration pond site and in nearby domestic wells; upgrade treatment process.
Archeological and Historical Resources	Inundation of .25 miles of the Prineville-Bend wagon road. Disturbance to archeological sites.	Map, describe and photograph sites; minimize ground disturbance.
Wildlife and Vegetation	Loss of vegetation and sedentary wildlife.	Confine construction activities to as small an area as possible.

The No-Action Alternative

The no-action alternative is the 160-acre interim effluent disposal project which is designed to have an effluent disposal capacity of about 2.5 MGD. The EPA considers the interim evaporation/infiltration pond to be potentially acceptable as part of the permanent 6 MGD effluent disposal facility. The EPA is concerned, however, about the sizing of the pond for a 6 MGD capacity and possible long-term adverse impacts on groundwater. Therefore, EPA has required the City of Bend to monitor groundwater quality and subsurface flow beneath the interim ponds. The interim project will serve in effect as a pilot project. Monitoring and operational data should provide the additional information needed by the City to determine if evaporation/infiltration is suitable as a long-term disposal method. The interim project is expected to operate for a term not to exceed 3 years.

The interim disposal facility is located on BLM land; consequently, the City of Bend must comply with conditions outlined in their lease agreement. According to the BLM lease (September 24, 1980), the City of Bend may use the interim infiltration pond site for a period of 3 years. At the end of the second lease year, the city must decide, based on available operational and groundwater monitoring data, if the interim infiltration pond will become part of the permanent effluent disposal facility and notify BLM of their decision. At about the same time, the city must apply to the EPA for grant funding to construct a permanent effluent disposal facility. The EPA will utilize information provided to them by the city to evaluate the proposed project as required under the NEPA.

Chapter 4

Comments and Responses to the Draft EIS

Chapter 4

COMMENTS AND RESPONSES TO THE DRAFT EIS

Letters of Comment

This section contains letters of comment from agencies and organizations on the Draft EIS for the City of Bend. Those letters which commented directly upon the Draft EIS have been reproduced in this section. Wherever a response is required by EPA to the letter, a response page follows that letter.

Table 4-1 is a listing of the comment letters received during the 45-day review period, including a general category listing of their contents. Comment categories are shown in an attempt to indicate those aspects of the proposed project about which the commenters were most interested and concerned. This may serve to direct the reader to those sections of the document which he or she may wish to restudy.

The EPA wishes to express its appreciation to all commenting agencies and organizations for the time and effort spent in reviewing the Draft EIS. All comments were fully considered prior to formulating the EPA's recommended proposed action.

Table 4-1. Summary of Letters of Comment on the City of Bend Draft EIS

	GROUNDWATER	SOILS	SURFACE WATER	LAND USE PLAN	VEGETATION	HEALTH & SANITATION	FOOD CROPS	RECREATION & AESTHETICS	FISH & WILDLIFE	ALTERNATIVES	ARCHEOLOGIC/HISTORIC PRESERVATION	LEGAL/LIABILITY	BIRD HAZARDS/AIRCRAFT	HYDROGEOLOGIC	COST
1. Jefferson County Pomona Grange #32, Madras, Oregon										X					
2. Avion Water Company, Bend, Oregon	X											X			
3. Advisory Council on Historic Preservation, Washington, DC											X				
4. State of Oregon Aeronautics Division, Salem, Oregon													X		
5. League of Women Voters of Deschutes County, Bend, Oregon	X					X			X	X					X
6. Oregon Environmental Council, Portland, Oregon	X	X				X		X		X					X
7. Water Resources Department, Salem, Oregon	X	X	X						X	X				X	X
8. U. S. Department of the Interior, Office of the Secretary, Portland, Oregon	X	X	X		X	X		X	X	X	X			X	X
9. Oregon Department of Fish and Wildlife			X	X	X				X	X					X
10. Department of Land Conservation and Development				X											
11. Law Offices of Rodriguez, Glenn and Wilkinson, Madras, Oregon	X		X		X	X	X			X		X			
12. City of Redmond, Deschutes County, Oregon						X				X					
13. U. S. Department of Agriculture, Soil Conservation Service, Portland, Oregon					X				X						
14. Department of Environmental Quality, Portland, Oregon	X		X		X	X				X					

United States Department of the Interior

OFFICE OF THE SECRETARY
PACIFIC NORTHWEST REGION
500 N.E. Multnomah Street, Suite 1692, Portland, Oregon 97232

December 5, 1979

ER-79/1013

RECEIVED
DEC 10 1979
EPA-EIS

Mr. Roger K. Mochnick
Acting Chief
Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101

Dear Mr. Mochnick:

Thank you for the opportunity to review and comment on the draft environmental statement for Sewage Effluent Disposal for the City of Bend, Oregon.

General Comments

1 Field investigations underway by Geological Survey indicate that an interpretation of the hydrogeologic system differing from that presented in the environmental statement warrants serious consideration. The Geological Survey interpretation suggests that the conclusion that "It is likely no signicant amount of effluent discharged to the subsurface would enter the deep artesian aquifer" is open to some question and that additional coverage should be given to potential groundwater contamination and alternative disposal methods.

2 The draft statement is inadequate in its consideration of historic and archaelogical resources which could be impacted by project construction.
3 Some further consideration should have been given also to downstream effects of effluent discharge on recreational resources.

Specific Comments

Pages 1-5, Summary

4 Disposal to Drill Holes. As stated, the major adverse impact associated with subsurface disposal to drill holes would be the potential for groundwater contamination. In the event of domestic well water contamination by this alternative, additional mitigation measures could be replacement of the contaminated deep aquifer or alternative water source with a piped distribution at

4 City expense, or direct compensation or payment to the affected owners to case out the contaminated aquifer and deepen the wells or redrill in a new location into a safe aquifer.

5 Disposal by Infiltration Ponds. We suggest that the reduced potential for groundwater contamination should be listed as a favorable and not a major adverse impact of subsurface disposal via infiltration ponds. As noted on page 80, removal of B.O.D. and bacteria is estimated to be greater than 98 percent in infiltration ponds. According to page 44, the development of infiltration ponds would require only 85 acres which is considerably less than that required for the evapotranspiration pond alternative (1,305 acres) or spray irrigation alternative (1,350 acres); hence, this would seem to be only a moderate land commitment.

6 It might also be helpful to the reviewer to have highlighted in the summary some of the significant information from pp. 90-92 regarding the relative effectiveness of infiltration ponds in providing a greater degree of disinfection of water compared to other proposed alternatives.

7 Disposal by Evapotranspiration Ponds. We recommend that mention be made of the major impact of the solids removal problem from the evapotranspiration ponds which are sealed with bentonite.

Disposal by Spray Irrigation. Major adverse impacts noted, such as large land commitment and significant loss of vegetation and associated wildlife, are apparently based on the assumption that all the irrigation will be on newly developed land and not on land that is already farmed. Even if this were the case, the loss of vegetation would be a short term effect with the resultant irrigated crop being more luxuriant and better ground cover than the original cover. Under average conditions 6mgd effluent water would be sufficient to irrigate 600 acres; however, as spray irrigation is more efficieit, the report estimates 1,150 acres can be irrigated; but this land requirement may be reduced by using crops requiring large quantities of water, such as alfalfa.

The economical return from this irrigated land has not been mentioned. If irrigation by conventional gravity laterals were feasible in this area, this would likely result in a reduced investment cost.

No Action Alternative. It might be useful to reviewers to have the information on the Summary section that the Oregon Department of Environmental Quality placed a ban on construction of additional sink holes in the Bend urban area for disposal of inadequately treated wastes and prohibited their use beyond January 1980.

Page 3, Table A. Vegetation and odors adverse impacts for the North Unit Main Canal should be shown with at least moderate impact (0) and not negligible impact to be consistent with the rest of the report. The increased B.O.D., nutrients, and higher water temperature of the sewage effluent is bound to result in accelerated growth along the canal and in Haystack Reservoir, and would pose a problem. Similarly, any odors associated with the sewage effluent would be spread by the canal over a wide area.

8 Page 38, Table 3-2. We suggest that individual measurements be given for ammonia and nitrates since they are both important measurements of pollution and effectiveness of the sewage treatment. Note the effects of ammonia listed on pages 99 and 100 which point out that the presence of ammonia, which has an affinity to oxygen, will result in a reduction in dissolved oxygen and is toxic to aquatic life. According to page 100, the allowable concentration of ammonia at discharge point in the mixing zone is about 1.2 mg/l. The separate measurement of nitrogen in groundwater over 10 mg/l measured as nitrogen can cause "blue baby" (see page 89) and, hence, should be measured separately. With a measured total nitrogen level of 13 mg/l, both the above parameters for ammonia and nitrate may have been exceeded, so prompt dilution would be essential.

9 Page 68. According to the discussion of "Reliability," over half of the nation's treatment facilities do not meet EPA's secondary treatment standards either because of operation and maintenance deficiencies or design deficiencies. Given this high probability of treatment plant failure, it is our suggestion that (particularly in the Deschutes River and North Unit Canal disposal alternatives) the potential impacts associated with possible failure be fully discussed in order that the reviewer may understand the range of impacts for each of the alternatives in a comparative manner.

10 Page 70, paragraph 1. Because correct interpretation of the hydrogeologic system is crucial to evaluation of the waste-effluent disposal problem, we suggest an additional alternative explanation for the system described. The system, as described from data obtained from the Forest Service well, is one that has been encountered during data collection throughout the Bend-Redmond area, and it appears to be the normal situation rather than a unique occurrence. Wells commonly tap water at some depth in the subsurface, but upon increasing the depth of the well, the water level in the well decreases in altitude. This situation of falling water level with increased depth of well penetration is one that characterizes recharge areas in groundwater flow systems. In reference to the right-hand part of the groundwater flow diagram (figure 6-2, page 76), the shallow water levels may represent perched groundwater bodies located above the regional flow system, but it is doubtful that this is true in most of the cases found in the area.

The principal source of recharge causing apparent flow-system anomalies probably is water lost to the subsurface from irrigation canals and, more importantly, from excess irrigation water applied to fields during flood irrigation. Recharge to the subsurface from flood irrigation and from canals in the heavily irrigated area between Bend and Redmond has caused a buildup of water levels as irregular ridges and mounds that cannot be easily contoured and which tend to mask the directions of local groundwater flow. Irrigation has been practiced in the area since the early 1900's, but it is not known yet whether this irregular groundwater mound is continuing to build up.

Page 71, paragraph 4. The last sentence speculates that there probably is no downward movement from the shallow zone into a deep underlying artesian aquifer system at the Forest Service well. Evidence already mentioned, however, suggests that there is a strong vertical downward component of groundwater flow at the Forest Service well and at other wells, including the city of Bend supply wells mentioned on page 70, paragraph 3.

10 If the alternative explanation of the groundwater flow system presented here is correct in part, it suggests that groundwater flow is much more complicated than that depicted in the draft statement and that the directions of movement of effluent in the subsurface probably will be more difficult to predict than expected.

Page 72, paragraph 5. Sentence 4 implies that lateral movement of groundwater in the regional groundwater flow system may be small. When evidence from all wells is considered, it becomes apparent that the regional flow system is a highly productive water-bearing unit. A few dozen large-capacity wells have been developed in the Bend-Redmond area during the past 15 years; most have specific capacities in excess of 50 gallons per minute per foot of drawdown, and their reported yields range from about 500 to over 5,000 gallons per minute. To our knowledge, in most cases where the depth of a well has not been a consideration, there have been few, if any, unsuccessful large-capacity wells drilled in the Bend-Redmond area. Paragraph 1 on page 80 is a similar type of statement that probably cannot be substantiated.

Page 78, item 3. The statement that "It is likely that no significant amount of effluent discharged to the subsurface would enter the deep artesian aquifer system" is too strong based on evidence at the Forest Service well, for example, and should be modified to indicate greater uncertainty.

11 Page 100. The residual presence of chlorine in the treated waste water will cause a problem for both alternatives of discharging to the Deschutes River or to the North Unit Main Canal since aquatic plants suffer from chlorine toxicity at levels greater than 0.003 mg/l, which would be exceeded; hence, dechlorination of the effluent is necessary.

12 Page 103. The draft statement refers to the adverse aesthetic effects of effluent disposal in the Deschutes River. The draft statement should be expanded to include possible impacts to Billy Chinook Reservoir and Cove Palisades State Park. The reservoir lies downstream of Bend, and the potential for reduction of water quality exists. Further downstream, the Deschutes River has been designated as a "State Scenic Waterway." Any possible impacts on the river at this point should be investigated and described.

13 Pages 103-105. Although the document mentions two historic roads cutting through Site E, as well as "a number of archeological sites containing cultural material" which occur on Site E, it does not appear that either full evaluation of the significance of these resources or an assessment of potential project effects on them has been carried out. It is also apparent from the discussion that there has been no attempt to identify and evaluate historic or archeological resources that might be impacted by:

(1) land disturbance associated with drill hole discharge on Site E;

(2) infiltration pond and connecting gravity pipeline construction (see figure 4-1);

(3) forcemain and pumping construction for river discharge (see figure 4-2);

(4) pipeline canal and evapotranspiration pond construction;

(5) irrigation system and storage reservoir construction; and

(6) forcemain construction to the North Unit Main canal.

We found no indication in the draft statement that the Oregon State Historic Preservation Officer has been consulted.

The draft statement should document completed or intended compliance with 36 DFR 800, as amended (Federal Register, January 30, 1979) in regard to required consultation with the State Historic Preservation Officer. These requirements include consultation on: the need for and type of surveys to identify eligible historic and archeological properties, survey boundaries, application of National Register criteria to identified properties, determination of effect of the proposal on National Register or eligible properties, and other 36 DFR 800.4 procedures if such properties will be affected.

14 Page 115, paragraph 4. Sentence 3 downplays possible vertical movement in the regional flow system, and also should be modified. This statement implies the "deep artesian zone" is not hydrologically connected to overlying saturated zones. We consider that implication to be false.

Sincerely yours,

Charles S. Polityka

Charles S. Polityka
Regional Environmental Officer

Response to Comments from the U. S. Department of the Interior, Office of the Secretary, December 5, 1979

1. The City of Bend will utilize all available sources of information, including the Geological Survey, in evaluating the environmental impacts of interim effluent disposal via infiltration on underlying groundwater systems.

2. As a condition of grant funding for an ultimate effluent disposal method, EPA will require a survey of archeological and historical resources commensurate with state and federal regulations.

3. Comment noted. Discharge of effluent to the Deschutes River has been dropped from consideration as an ultimate method of effluent disposal.

4. Comments noted. This alternative has been dropped from consideration as an ultimate method of effluent disposal.

5. In Table A, page 3 of the DEIS, the potential for impacts on groundwater from disposal of effluent via infiltration ponds is indicated as a moderately adverse impact.

6. Comments noted. Additional information on the relative effectiveness of infiltration ponds in providing disinfection of effluent should be produced by the interim effluent disposal monitoring program.

7. Comments noted. These alternatives have been dropped from consideration as ultimate methods of effluent disposal.

8. Comments noted.

9. Comments noted. If discharge to the North Unit Main Canal is reevaluated as an ultimate method of effluent disposal, discharge facilities should include an infiltration pond or storage reservoir to accommodate winter effluent flow and emergency needs.

10. Comments noted. See response to comment #1.

11. Comments noted. Discharge of effluent to the Deschutes River has been dropped from consideration as an ultimate method of effluent disposal. If discharge to the North Unit Main Canal is reevaluated as an ultimate method of effluent disposal, the impacts of residual chlorine on aquatic life will be investigated in greater detail. Impacts could also be mitigated through dechlorination of the effluent.

12. Comment noted. See response to comment #3.

13. Historic roads, as well as any archeological and cultural resources identified in the project area, were evaluated with respect to their eligibility for inclusion on the National Register of Historic Places. One historic road in the study area, the Meeks Trail, which has been placed on the National Register, would not be impacted by any alternative of effluent disposal. A 100% archeological and historical survey was conducted on the proposed project site for interim infiltration ponds. No resources were found to be eligible for inclusion on the National Register. As a grant condition for funding an ultimate effluent disposal method, the Environmental Protection Agency will request an appropriate survey of archeological and historical resources for any land area not previously surveyed. The State Historic Preservation Office has and will be consulted on all archeological/historical investigations.

14. Comments noted.

VICTOR ATIYEH
GOVERNOR

State of Oregon Aeronautics Division

3040 25th STREET S.E., SALEM, OREGON 97310 PHONE 378-4880

October 30, 1979

RECEIVED
NOV 5 1979
EPA-EIS

Mr. Roger Mochnick, M/S443
Acting Chief
U.S. Environmental Protection
Agency, Region X
1200 Sixth Avenue
Seattle, WA 98155

Dear Mr. Mochnick:

1 The Oregon Aeronautics Division and the Department of Transportation have jointly reviewed the recently published document entitled Sewage Effluent Disposal for the City of Bend, Oregon and find a significant omission. The issue of potential collisions of birds and airborne aircraft has not been discussed. National studies have proven that water bodies can attract birds which hover at low elevations in the way of aircraft during take-off or landings. The proposed Sewage Effluent Disposal area to be located close to Bend's Municipal Airport lies under the flight path of most aircraft traveling to or from this airport. The Bend Municipal Airport is considered essential to the State and National System of airports. We suggest all precautions should be taken to protect the investment in this valuable facility as well as to ensure safety of the pilots and general public using it.

It is, therefore, our recommendation that this document be revised to include the issue of the potential bird strike hazard and an analysis of mitigation measures available to eliminate the conflict between birds and aircraft.

Sincerely,

Paul E. Burket
PAUL E. BURKET
Aeronautics Administrator

CS:PEB:seh

A DIVISION OF THE DEPARTMENT OF TRANSPORTATION
A MEMBER OF THE NATIONAL ASSOCIATION OF STATE AVIATION OFFICIALS

Response to Comments from the State of Oregon Aeronautics Division

1. The issue of the potential bird strike hazard related to use of infiltration or evaporation ponds for effluent disposal and suggested mitigation measures were discussed on pages 56, 92 and 95 of the Draft EIS.

It is understood that the Bend Airport expansion will not be designed to accommodate turbojet aircraft, therefore, any facilities attracting bird life should not be located within 5,000 feet of the airport runway unless provisions are made to prevent bird strike hazards (Dempsey pers. comm.). No open water facilities will be located within 5,000 feet of the airport runway.

The potential for bird strike hazards in relation to the infiltration pond facility has been coordinated with the Deschutes County Planning Department. Aquatic vegetation will be controlled within the infiltration pond to minimize attraction of water-associated birds.

**Advisory
Council On
Historic
Preservation**

1522 K Street NW.
Washington D.C.
20005

Reply to: **P. O. Box 25085
Denver, Colorado 80225**

This response does not constitute Council comment pursuant to Section 106 of the National Historic Preservation Act, nor Section 2(b) of Executive Order 11593.

November 2, 1979

RECEIVED
NOV 5 1979
EPA-EIS

Mr. Roger K. Mochnick, EIS Coordinator
Environmental Evaluation Branch
Environmental Protection Agency
1200 Sixth Avenue, M/S 443
Seattle, Washington 98101

Dear Mr. Mochnick:

This is to acknowledge receipt of the draft environmental statement for sewage effluent disposal for the City of Bend, Oregon on October 25, 1979. We regret that we will be unable to review and comment on this document in a timely manner pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969.

1 Nevertheless, the Environmental Protection Agency is reminded that, if the proposed undertaking will affect properties included in or eligible for inclusion in the National Register of Historic Places, it is required by Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. Sec. 470f, as amended, 90 Stat. 1320) to afford the Council an opportunity to comment on the undertaking prior to the approval of the expenditure of any Federal funds or prior to the issuance of any license. The Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800.4) detail the steps an agency is to follow in requesting Council comment.

Generally, the Council considers environmental evaluations to be adequate when they contain evidence of compliance with Section 106 of the National Historic Preservation Act, as amended. The environmental documentation must demonstrate that either of the following conditions exists:

1. No properties included in or that may be eligible for inclusion in the National Register are located within the area of environmental impact, and the undertaking will not affect any such property. In making this determination, the Council requires:

--evidence that the agency has consulted the latest edition
1 of the National Register (Federal Register, February 6, 1979,
and its monthly supplements);

--evidence of an effort to ensure the identification of properties eligible for inclusion in the National Register, including evidence of contact with the State Historic Preservation Officer, whose comments should be included in the final environmental statement.

2. Properties included in or that may be eligible for inclusion in the National Register are located within the area of environmental impact, and the undertaking will or will not affect any such property. In cases where there will be an effect, the final environmental statement should contain evidence of compliance with Section 106 of the National Historic Preservation Act through the Council's regulations, "Protection of Historic and Cultural Properties".

Should you have any questions, please call Brit Allan Storey at (303) 234-4946, an FTS number.

Sincerely,

Louis S. Wall
Chief, Western Office
of Review and Compliance

Response to Comments from the Advisory Council on Historic Preservation, November 2, 1979

1. The U. S. Bureau of Land Management (BLM) has negotiated a land lease with the City of Bend for the site of the interim infiltration pond. As a part of this process a 100% archeological survey of the project area was conducted. The survey concluded that there were no archeological or historical sites eligible for inclusion in the National Register of Historic Places on the proposed project site. The State Historic Preservation Office (SHPO) has concurred with this conclusion.

When an ultimate effluent disposal option is chosen, a professional archeologist will conduct an archeological and historical survey of the proposed disposal site as a condition of grant funding by EPA.

AVION WATER COMPANY
60813 PARRELL ROAD
BEND, OREGON 97701
TELEPHONE (503) 382-5342

December 4, 1979

Avion Water Company, Inc. Concern and Comments Regarding Sewage Effluent Disposal for the City of Bend, Oregon.

Avion Water Company is very concerned about the method of sewage effluent disposal to be employed by the City of Bend, since underground water contamination could adversely affect over 3,100 Avion Water Company household customers.

Avion Water Company, in the event of contamination, would hold liable all parties involved for:

1 1. The public health of Avion's customers.

2. The expense of interim service to provide safe drinking water.

3. The cost of developing new sources.

4. Any additional operating expenses resultant from contamination; for example, any required additional pumping depth and sizing, and the additional replacement cost of oversizing equipment to compensate for the depth.

5. Any operating loss and any loss of profit to Avion stockholders.

AVION WATER COMPANY, INC.

Paul C Ramsay
Paul C. Ramsay
President

PCR:em

Response to Comments from the Avion Water Company, December 4, 1979

1. Comments noted.

LEAGUE of WOMEN VOTERS of DESCHUTES COUNTY

RECEIVED
DEC 10 1979
EPA-EIS

December 4, 1979

League of Women Voters
of Deschutes County
P.O. Box 6453
Bend, Oregon

EPA Hearing on the Draft EIS for Sewage Effluent Disposal For The City Of Bend, Oregon

The League Of Women Voters of Deschutes County, after reviewing the EPA Environmental Impact Study concerning sewage disposal for the City of Bend, supports the use of Evapotranspiration Ponds or Land Application by Spray Irrigation as acceptable alternatives. We do not support the use of drill holes.

We favor the Evapotranspiration Ponds used as a treatment process as the preferred method. The three factors leading to this choice were the mitigation measures which are specific and obtainable, the treatment reliability of this alternative, and that it is a year round system. The user costs initially look higher than the other methods; however,
1 we urge that the Evapotranspiration Ponds be considered for additional funding as suggested in the EIS because of possible qualification as "innovative or alternative technologies". League feels that the wetlands created through the Evpaotranspiration Ponds alternative would create a habitat type near Bend that currently does not exist in comparable acreage. League also feels it fits in with the environmental nature of the community.

The Land Application by Spray Irrigation alternative is our second choice. To reuse treated water in a productive manner is certainly preferable to any irretreviable disposal method. We feel that adequate health and sanitary standards will be maintained if used with the DEQ proposed policy for land irrigation and disposal of treated sewage as outlined in the EIS.

We do not support the use of subsurface disposal via drill holes. There are unknown factors involved that do not begin to guarentee safe

BEND, OREGON 97701

1 health standards. The most significant of these is the groundwater contamination potential. Although this alternative is much less costly to the user now, it could become the most costly in the long run if we have to start cleaning up the water later.

We urge the adoption of the Evapotranspiration Ponds as Bend's treatment method. The League feels this best fits the needs and desires of our community.

Ann Free

Ann Free, President

Response to Comments from the League of Women Voters of Deschutes County, December 4, 1979.

1. Comments noted.

December 4, 1979

Environmental Protection Agency,

Hearing in Bend High School, in C Hall.

Jefferson County Pomona Grange #32, voted to send a letter to this meeting in protest to putting the sewer effuenet into the North Unit Irrigation Canal.

Pomona Grange represents three granges, and has over 150 members. Haystack Grange and Mud Springs Grange are in the North Unit Irrigation project.

1 It seems unreasonable for this meeting to be in the City of Bend. The people of North Unit Irrigation live in Jefferson County, and no direct publication was issued.

North Unit Irrigation is not the dumping ground for Bend, Oregon.

DEQ Policy has been to allow pasture grass raised with this effluent of sewer ponds. North Unit would be ruined for raising potatoes, wheat, and mint.

Where is the Environmental Protection Agency Impact Study on putting the iffluent in North Unit Irrigation District.

Representative Arthur C. [illegible]
R 1 Box 257
Madras Oreg

[illegible] M Barger (Pomona Master)
Master

Erma Rufener
Secretary

Response to Comments from the Jefferson County Pomona Grange #32, December 4, 1979

1. Although effluent disposal to the North Unit Main Canal (NUMC) is considered by the Environmental Protection Agency to be the environmentally preferred alternative, it is recognized that canal disposal is not feasible at this time due to concerns raised in your letter as well as by the North Unit Irrigation District and others. As an interim measure, the Environmental Protection Agency has selected the infiltration pond alternative for effluent disposal. Monitoring wells will be constructed in conjunction with this disposal option. Information from these wells will assist the City of Bend in determining the impacts of infiltration on groundwater. In the event that infiltration is found to be unsafe environmentally as an ultimate disposal option, the other disposal methods will be reevaluated.

RECEIVED
DEC 10 1979
EPA-EIS

OREGON ENVIRONMENTAL COUNCIL
2637 S.W. WATER AVENUE, PORTLAND, OREGON 97201 / PHONE 503/222-1963

ALTERNATIVE FUTURES Tigard
AMERICAN INSTITUTE OF ARCHITECTS
Portland Chapter
AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS
Oregon Chapter
ASSOCIATION OF NORTHWEST STEELHEADERS
ASSOCIATION OF OREGON RECYCLERS
AUDUBON SOCIETY
Central Oregon, Corvallis, Portland, Salem
BAY AREA ENVIRONMENTAL COUNCIL
Coos Bay
B.R.I.N.G.
CENTRAL CASCADES CONSERVATION COUNCIL
CHEMEKETANS, Salem
CITIZENS FOR A BETTER GOVERNMENT
CITIZENS FOR A CLEAN ENVIRONMENT
CLATSOP ENVIRONMENTAL COUNCIL
CONCERNED CITIZENS FOR AIR PURITY
Eugene
DEFENDERS OF WILDLIFE
ECO-ALLIANCE, Corvallis
ENVIRONMENTAL ACTION CLUB
Parkrose High School
EUGENE FUTURE POWER COMMITTEE
EUGENE NATURAL HISTORY SOCIETY
GARDEN CLUBS of Cedar Mill, Corvallis,
McMinnville, Nehalem Bay, Scappoose
GRANT COUNTY CONSERVATIONISTS
H.E.A.L., Azalea
LAND, AIR, WATER, Eugene
LEAGUE OF WOMEN VOTERS
Central Lane, Coos County
McKENZIE GUARDIANS, Blue River
NORTHWEST ENVIRONMENTAL DEFENSE CENTER
OBSIDIANS, Eugene
1,000 FRIENDS OF OREGON
OREGON ASSOCIATION OF RAILWAY PASSENGERS
OREGON BASS AND PANFISH CLUB
OREGONIANS COOPERATING TO PROTECT WHALES
OREGON FEDERATION OF GARDEN CLUBS
OREGON GUIDES AND PACKERS
OREGON HIGH DESERT STUDY GROUP
OREGON LUNG ASSOCIATION
Portland, Salem
OREGON NORDIC CLUB
OREGON NURSES ASSOCIATION
OREGON PARK & RECREATION SOCIETY
Eugene
OREGON ROADSIDE COUNCIL
OREGON SHORES CONSERVATION COALITION
O.S.P.I.R.G.
PLANNED PARENTHOOD ASSOCIATION, INC
Portland
PORTLAND ADVOCATES OF WILDERNESS
PORTLAND RECYCLING TEAM, INC.
RECREATIONAL EQUIPMENT, INC.
SANTIAM ALPINE CLUB
Salem
SIERRA CLUB
Oregon Chapter
Columbia Group, Portland
Klamath Group, Klamath Falls
Many Rivers Group, Eugene
Mary's Peak Group, Corvallis
Mt. Jefferson Group, Salem
Rogue Valley Group, Ashland
SOLV
SPENCER BUTTE IMPROVEMENT ASSOCIATION
STEAMBOATERS
SURVIVAL CENTER
University of Oregon
THE TOWN FORUM, INC.
Cottage Grove
TRAILS CLUB OF OREGON
UMPQUA WILDERNESS DEFENDERS
WESTERN RIVER GUIDES ASSOCIATION, INC.
WILLAMETTE RIVER GREENWAY ASSOCIATION

December 7, 1979

To: Roger Mochnick, M/S 443
Acting Chief
U.S. Environmental Protection Agency,
Region X
1200 Sixth Avenue
Seattle, Wash. 98101

From: Bruce Merrick for Oregon Environmental Council

In compliance with your request concerning the Draft EIS-SEwage Effluent Disposal for the City of Bend, Oregon, The Oregon Environmental Council submits the following comments and suggestions for your consideration:

All of the alternatives listed in the Draft EIS involve:

a) Significant to moderate environmental impact;
b) Significant cost to taxpayers and residents;
c) Significant energy consumption.

We realize the "No Action Alternative" is out of the question. Therefore we would like to comment as follows:

1) Subsurface disposal.

Comment

This alternative definitely is hazardous with no consideration to future generations.

2) Discharge to the Deschutes River

Comment

This alternative would require the effluent to meet drinking water standards, as the water will be used for human consumption for municipal water supplies for Madras and Redmond, by fishermen and recreationalists.

3) Discharge to Evaporation Ponds

Comment

This alternative will result in stagnation of land and soil pollution. It makes no attempt to recycle water and creates a possible health hazard due to airborne bacteria.

4) Land Application via Spray Irrigation

Comment

With the establishment of a broad enough base, this alternative can make use of the water but still presents a possible health hazard. It is also a very costly alternative.

5)Establishment of Wildlife Marsh Area

Comment

1 Good intentions, but aside from aesthetics there is no real advantage over the other alternatives. No direct profit from water recycling. A large land area is involved. There are possible health hazards again, though the hazards are remote if filtration is used.

General Comments

The study does not single out any one alternative as being more advantageous than any one of the others. Therefore OEC suggests the following:

1)Sewage should be treated with active anaerobic digestion, generating methane.

2

2)Solids should be removed by settling and filtration. Effluent may then be distilled at 400 F in an efficient system (i.e. incoming effluent used as a condensate in an evaporator of sufficient capacity, the system being insulated to minimize heat loss.) Evaporation may be accomplished with the aid of solar and methane heat. The condensate may then be mildly chlorinated, monitored, and released to the North Unit Irrigation Canal (summer) and to the Deschutes River (winter).

3)All removed solids might then be sold to the agriculture fertilizer industry to help defray costs of the sewage treatment system.

4)As there are efficient solar stills in operation, producing safe drinking water from sea water at Rocky Point in Baja, Calif., and in Saudi Arabia, this technology may be applied to effluent treatment. Such treatment would provide for two valuable resources while using the sewage efficiently.

Response to Comments from the Oregon Environmental Council, December 7, 1979

1. Comments noted.

2. The Environmental Protection Agency has approved interim disposal of effluent via infiltration ponds. An ultimate disposal option has not been selected at this time.

VICTOR ATIYEH
GOVERNOR

Executive Department
INTERGOVERNMENTAL RELATIONS DIVISION
ROOM 306, STATE LIBRARY BLDG., SALEM, OREGON 97310

December 7, 1979

RECEIVED
DEC 12 1979
EPA-EIS

Roger Mochnick, M/S 443
Acting Chief
U.S. Environmental Protection Agency
Region 1
1200 Sixth Avenue
Seattle, WA. 98101

SEWAGE EFFLUENT DISPOSAL FOR BEND, OREGON
PNRS 7910 4 540

Thank you for submitting your draft Environmental Impact Statement for State of Oregon review and comment.

Your draft was referred to the appropriate state agencies. The Departments of Land Conservation and Development, Fish and Wildlife offered the enclosed comments which should be adressed in preparation of your final Environmental Impact Statement.

We will expect to receive copies of the final statements as required by Council of Environmental Quality Guidelines.

Kay L. Wilcox
Kay Wilcox, A-95 Coordinator

KW:cb
Enclosures

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
306 State Library Building, Salem, Oregon, 97310
Phone Number: 378-3732

PNRS STATE REVIEW

Project #: ______________ Return Date: ______________

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW DRAFT STATEMENT

( ) This project has no significant environmental impact.

(X) The environmental impact is adequately described.

( ) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

Comments are attached.

ency [illegible] [illegible] By ______________

NMENTAL MANAGEMENT SECTION 11/29/79

PNRS 7910-4-540

The Oregon Department of Fish and Wildlife has reviewed the sewage effluent disposal for the City of Bend, Oregon, draft environmental statement, and has the following comments.

The draft discusses several alternatives for effluent discharge. The department's preferred alternative would be the development of a series of sealed ponds that would provide enhanced wildlife habitat. We recognize, however, that the excessive cost estimates for this proposal are beyond the available funding limits.

The department also favors development of infiltration ponds. Some changes in wildlife use would be expected from this proposal; however, the changes are regarded as beneficial.

1 Discharge of effluent into the Deschutes River is unacceptable. During the low flow period, nutrient levels in the discharge could cause growth of undesirable quantities of algae or other aquatic vegetation in the river. Discharge of effluent into the North Unit Canal is not an acceptable alternative. Summer discharge would add additional nutrients, which have an impact on water quality in Haystack Reservoir. Water quality problems have previously been noted in Haystack Reservoir, where nuisance algae blooms and low dissolved oxygen levels have impacted fish production. Additional nutrients added to this impoundment would aggravate the existing problems.

Subsurface disposal of effluent into drilled disposal wells has no identified adverse impact on fish and wildlife. The uncertainty of the ultimate disposition of this material would make this alternative questionable.

Land application by spray irrigation would commit large quantities of land to a single use. This development would have some adverse impacts on existing wildlife populations.

Response to Comments from the Oregon Department of Fish and Wildlife, November 23, 1979

1. Comments noted.

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

DEPARTMENT OF
LAND CONSERVATION
AND DEVELOPMENT

Intergovernmental Relations Division
306 State Library Building, Salem, Oregon, 97310
Phone Number: 378-3732

1979

PNRS STATE REVIEW

Project #: BEND 791 Return Date: ____________

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

( ) The environmental impact is adequately described.

(X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

1 The EIS report did an adequate job of identifying the six alternatives for sewage afluent disposal for the City of Bend. Before a final alternative is selected it must be compared with the Deschutes County Comprehensive Plan to ensure that the alternative is in compliance with their comprehensive plan. Any discussion of adoption of a final alternative should be closely coordinated with the Deschutes County Board of Commissioners.

Agency LCDC By ____________

Response to Comments from the Oregon State Land Conservation and Development Commission, November 23, 1979

1. The proposed site plan for interim effluent disposal via infiltration ponds was reviewed by the Deschutes County Planning Department and County Board of Commissioners. They concluded that the site plan was generally consistent with the Deschutes County Year 2000 Comprehensive Plan. Complete approval of the project was granted by Deschutes County, subject to a number of conditions. Selection of an ultimate disposal method, whether it is an expansion of the infiltration pond or a new alternative, will be subject to the County's Site Plan Review process.

CITY OF REDMOND

DESCHUTES COUNTY, OREGON

455 SOUTH SEVENTH STREET
PHONE 548-2148
REDMOND, OREGON 97756

December 5, 1979

RECEIVED
DEC 11 1979
EPA EIS

Mr. Roger K. Mochnick, EIS Coordinator
Environmental Evaluation Branch
Environmental Protection Agency
1200 Sixth Avenue, M/S 443
Seattle, WA 98101

Dear Roger:

I was very much impressed with the hearing on the Environmental Impact Statement concerning the sewer effluent disposal for the City of Bend, which was held at the Bend High School on December 4, 1979.

I further thought that all of the questions relevant to the issue were answered. Under the circumstances, I appreciated the fact that the hearings officer allowed considerable latitude for discussion of issues not immediately related to the subject.

I would like very much to have the following statement included in the official record as the postion of the City of Redmond on this matter.

1 THE FOLLOWING IS THE PRESENT POSITION OF THE CITY OF REDMOND CONCERNING THE METHOD OF SEWER EFFLUENT DISPOSAL FROM THE TREATMENT PLANT NOW BEING CONSTRUCTED BY THE CITY OF BEND.

While the City of Redmond enthusiastically supports the Bend sewer project, it is also very concerned about the continued purity of the water supply in Central Oregon. The City of Redmond is, therefore, strongly opposed to any permanent system of treated sewage effluent disposal which is designed to introduce into the earth or into the Deschutes River upstream of the City of Redmond's water collection points, any water which does not meet State and Federal standards for drinkability.

The City is not opposed to the City of Bend's proposal for temporary percolating/evaporating ponds, so long as they are reviewed within three years. We do oppose any system of disposing of untreated sewage into individual dry wells.

The City of Redmond has no preference among the other alternative permanent methods of sewage effluent disposal which do not violate the above criteria.

Sincerely,

Sam Johnson
Mayor

SSJ:lj

Response to Comments from the City of Redmond, December 5, 1979

1. Comments noted.

VICTOR ATIYEH
GOVERNOR

Water Resources Department
MILL CREEK OFFICE PARK
555 13th STREET N.E., SALEM, OREGON 97310
PHONE 378-8455

RECEIVED
DEC 10 1979
EPA-EIS

TO: Roger K. Mochnick
Environmental Protection Agency

DATE: December 7, 1979

FROM: Kent Mathiot

SUBJECT: Bend Effluent Disposal Project.

We have reviewed the draft environmental statement on the sewage effluent disposal project for the City of Bend, and are submitting the following comments for your consideration.

The report presents an adequate general description of each of the disposal options under consideration. However, the information contained in the report does not provide answers to many of the basic environmental protection questions associated with the disposal project, and additional work needs to be carried out before an ultimate disposal method is selected.

1 Especially lacking is quantitative information to support the statements on the hydrogeologic characteristics of the study area. Specifically, additional information is needed to support statements concerning (1) the lateral extent and susceptibility to contamination of the deeper "artesian" aquifer, (2) the suggested low productivity of the regional aquifer, (3) the ground water flow direction in the immediate area of the disposal site, and (4) the location, production capabilities, and hydrogeologic characteristics of any perched aquifers near the disposal site. The need for this additional information is supported by several statements in the draft report that address the lack of existing detailed hydrogeologic information, and stress the potential variability of hydrogeologic conditions from site to site.

The information presented on the infiltration and percolation characteristics of the soil materials at the proposed evapo-percolation pond site is encouraging, and was evidently developed through actual testing at the proposed site. This preliminary data should be expanded by providing additional detailed information on the lateral extent, thickness, textural characteristics, and cation exchange capacity of the soil materials in the disposal area. Such information is necessary to properly evaluate the evapo-percolation option. Similar effluent treatment capability information should be developed for the various sedimentary interflow deposits.

The draft statement should be accepted as the environmental statement for an interim disposal program. The interim permit should be issued only if an evapo-percolation system is used, and then, only if surface materials at the disposal site are not removed and the underlying basalts are not artificially fractured.

2 Funding should be provided to support additional research into the subsurface and wildlife habitat disposal options. This research should concentrate on methods of lowering the cost of the wildlife habitat option, and on obtaining the above mentioned information necessary for evaluation the various subsurface disposal proposals. Any subsurface disposal program chosen as an ultimate disposal method should utilize the natural treatment characteristics of the soil and underlying sedimentary materials, and maximize the separation distance between the lowest point of the disposal zone and the underlying water table. This additional research should also consider options involving combinations of evaporation and evapo-percolation systems.

cla

Response to Comments from the Oregon State Water Resources Department, December 7, 1979

1. A document entitled Design Definition Memorandum No. 11, Subsurface Effluent Disposal Feasibility Investigation prepared by Bend Engineering Consultants (December 1979) provides additional quantitative information regarding hydrogeologic and soil characteristics of the study area. EPA has stated, however, that they would approve interim and/or ultimate use of a drill hole only if it was found to be environmentally acceptable in the Draft EIS and if no other method of disposal was available.

   Subsurface effluent disposal by infiltration, as described in Chapter 3 of this document, will allow effluent to percolate through 3-5 feet of soil before entering the subsurface. A monitoring well system will be established to document movement of the effluent plume and determine groundwater quality.

2. Comments noted.

LAW OFFICES

RODRIGUEZ, GLENN & WILKINSON

406 5th Street
Madras, Oregon 97741

Sumner C. Rodriguez
David C. Glenn
Douglas R. Wilkinson
Edward E. Sites

Telephone 475-2272
Area Code 503

December 10, 1979

RECEIVED
DEC 12 1979
EPA-EIS

Roger Mochnick, M/S 443
Acting Chief
U. S. Environmental Protection Agency, Region X
1200 Sixth Avenue
Seattle, Washington 98101

Re: Comments on Draft Environmental Statement.

Dear Mr. Mochnick:

I am forwarding you a copy of the letter which I have sent to the City of Bend in respect to the proposal for the North Unit Canal. Please consider this as comments on the Environmental Impact Statement and include it in your records for the review and comment period.

Sincerely,

Douglas R. Wilkinson /af

Douglas R. Wilkinson

DRW/af
enc.

cc: Bob Wagner
North Unit Irrigation District

LAW OFFICES

RODRIGUEZ, GLENN & WILKINSON

406 5th Street
Madras, Oregon 97741

Sumner C. Rodriguez
David C. Glenn
Douglas R. Wilkinson
Edward E. Sites

Telephone 475 227
Area Code 503

December 10, 1979

Arthur R. Johnson
City Manager
City of Bend
P. O. Box 431
Bend, Oregon 97701

Re: Interim Effluent Disposal of Treated Water from the City of Bend, Oregon to the North Unit Irrigation District Canal near Bend, Oregon.

Dear Art:

The North Unit Irrigation District Board of Directors is adamantly opposed to the dumpin of Effluent into the North Unit Canal on an interim basis. There are numerous problems which are insurmountable before the summer of 1980 when the City of Bend sewer project i supposed to be on line.

The following is a list of some of the problems that have been brought up by the Board, however it is not intended to be all inclusive. A proposal to dump effluent in the Nort Unit canal will require careful study and I am sure there will be more problems that sho up.

1 1. There is a problem of increased servitude on the land over which the district's easements run. Arguably in the summer the effluent could be considered irrigat water, but in the winter months it would be sewage. A study of the various patents will be necessary to determine whether it will be necessary to condemn property in order to allow effluent to run through the canal.
2. There is a great concern by the Board that they will be caught in the middle of a power struggle between governmental agencies. They would like to have some type of guarantee that other governmental agencies would not put a burden on th district because of any effluent in the system. Examples of this would be Fish and Wildlife personnel being upset about the water quality and herbicide treatment as well as D. E. Q. involvement with waste water returning to the Deschute River.
3. With respect to liability insurance, there is a problem of the setting of limit and then what would happen were a claim to exceed the limits. At present there is no real effective way to collect and enforce a Judgment against a municipali This problem has been addressed by the Oregon State Bar section on local government and no one is really clear as to the best approach to take. Perhaps some type of bond with an escalating feature, but then one has to worry about how narrow the bond is to be construed.

Reproduced from best available copy.

4. As you are well aware, there have been many instances when there have been failures of treatment facilities along the Willamette River and untreated sewage has been discharged to the river. No one has been able to adequately explain how the City of Bend will be able to insure their system will never fail.
5. The increased weed problem has been addressed, but the effects of the nitrates on the present herbicide is really unknown. Charles Kissel of Magna Corp. has indicated to the Board that the nitrates that would be in the treated effluent could work on a catalytic level in causing the herbicide to dissipate. If this were to occur then more herbicide would be required and there is a chance that amounts in excess of 15 p.p.m. may be required to control the increased weed problem.
6. Along the same lines Mr. Kissel indicated there may also be a problem with sulfates that could cause damage to pumps and piping in the way of increased corrosion. This matter also apparently has not been studied.
7. The Board is especially concerned about the organochlorides that are created in the treatment process. These chemicals are toxic and do not dissipate. Because the water will be used on some food crops there is a possibility that they could become a part of the food chain much as D. D. T.
8. At present there is a potential for low head hydro projects on the main canal at the Crooked River. This would mean water would be diverted year around and in the winter months it would be dumped directly to the Crooked River after going through the turbine. This would mean that the effluent would be going directly into a river. It is the Boards understanding that E. P. A. has a policy that would not allow the effluent to be dumped into the Deschutes River and this merely would be an avoidance device with respect to that policy.
9. Until such project is in operation the canal would not have water diverted in it during the winter. There are problems of ice and increased maintenance on the canal that would be caused from this, but the main problem is what effect would this have in concentrating chemicals along the floor of the canal. It appears they might become quite concentrated and when the first water comes through in the spring there would be a very heavy concentration of those chemicals flushed through the whole system.
10. Another problem that involves the winter discharge is the potential sub-surface contamination. As you know there is extensive loss in the floor of the main canal and by allowing it to run some 8 miles down the canal before it goes into the ground appears to be just bringing the effluent that much closer to Jefferson County and creating a potential for contaminating the Deschutes Valley Water District's source at Opal Springs.
11 The phycological effect on food crops is virtually unknown. There is great concern by the District of a P. C. B. scare or a Cranberry scare. If such a thing were to happen it could have a devastating effect on the Jefferson County economy and it is doubtful that any liability insurance would cover any damages. It is unclear how you can educate the public concerning the effluent to prevent this.
12 At full capacity the discharge of the treatment plant will only provide a negligible increase to the irrigating capabilities of the District. Accordingly allowing effluent to be dumped in the canal it would appear that the district is receiving no benefits only a lot of problems.

1 As I indicated above, this list is not all inclusive, as one studies the proposal, one becomes aware of more problems. Accordingly the Board wants to make it clear that under no circumstances will they consider allowing effluent to be placed in the canal during 1980. At the present time the Board feels that the above problems are of such magnitude that the disposal of effluent to the canal will probably never be feasible as long as evapotranstiration are available.

If you have any questions please let me know.

Sincerely,

/s/ Douglas R. Wilkinson

Douglas R. Wilkinson

DRW/af

cc: Bob Wagner
✓ Roger Mochnick

Response to Comments from Rodriguez, Glenn and Wilkinson, Law Offices, December 10, 1979

1. Comments noted.

United States
Department of
Agriculture

Soil
Conservation
Service

1220 S.W. Third Avenue
16th Floor
Portland, Oregon 97204

December 12, 1979

RECEIVED
[illegible] 17 1979
[illegible]

Mr. Roger Mochnick, M/S 443
Acting Chief
U. S. Environmental Protection Agency, Region X
1200 Sixth Avenue
Seattle, Washington 98101

Dear Mr. Mochnick:

The Soil Conservation Service has reviewed the Draft Environmental Impact Statement, Sewage Effluent Disposal for the City of Bend, Oregon. We offer the following comments:

1 Page 20 - Range and Endangered or Threatened Species. Are there any threatened or endangered plant species that would be effected by the alternatives.

2 Also, the EIS should state if any prime agricultural land, wetlands, or flood plains are effected by the alternatives.

We appreciate the opportunity to review and comment on this draft.

Sincerely,

Guy Nutt

GUY W. NUTT
State Conservationist

cc:
Administrator, SCS, USDA, Washington, D.C. 20013

Response to Comments from the U. S. Department of Agriculture, Soil Conservation Service, December 12, 1979

1. No rare and endangered or threatened plant species were found in the project area.

2. No prime agricultural land, wetlands or floodplains would be impacted by any of the DEIS alternatives, including interim disposal of effluent by infiltration.

VICTOR ATIYEH
GOVERNOR

Department of Environmental Quality

522 SOUTHWEST 5TH AVE. PORTLAND, OREGON

MAILING ADDRESS: P.O. BOX 1760, PORTLAND, OREGON 97207

December 7, 1979

RECEIVED
DEC 17 1979
EPA-EIS

Mr. Roger K. Mochnick, EIS Coordinator
Environmental Evaluation Branch
Environmental Protection Agency
1200 Sixth Avenue, M/S 443
Seattle, WA 98101

Dear Mr. Mochnick:

The Department of Environmental Quality has the following comments on the draft EIS for Sewage Effluent Disposal for the city of Bend, Oregon:

1. These first comments are editorial in nature:

   a. Page 1, third line; change Disinfection to Disinfected.

   b. Page 1, third paragraph, second sentence; add the phrase "for disposal of raw sewage" between wells and after.

   c. Page 28, paragraph 1; Rimrock West is a community sewerage system which has been omitted.

   d. Page 30, third paragraph intimates that present sewage treatment plant does not provide secondary treatment. That, of course, is wrong.

   e. Page 40, paragraph entitled Year-round Drill Hole Disposal. Here the proposed treatment level is called secondary but what the report describes is more than secondary. It should be called advanced secondary or tertiary. 1

   f. Page 57, fourth paragraph; states that Oregon must develop a UIC program. That is not true. EPA can develop one if the state elects not to.

   g. Page 59, paragraph entitled Permit Requirements should indicate that Oregon administers the NPDES program in Oregon, not EPA.

   h. Page 68, Reliability. The report compares the proposed treatment plant to other secondary treatment facilities when indeed the proposed plant is more than secondary and therefore would be much more reliable.

i. Page 82, second paragraph; OAR-44-045 was recently modified.

1 j. Page 83, first paragraph; last sentence should include filtration in the definition of Redmond's water system.

k. Page 85; fourth paragraph should include filtration as a unit process in the Madras water treatment process.

2. The remaining comments are philosophical or technical:

2 a. On page 88, paragraph 5; the report declares that effluent going to the North Unit Canal would cause Haystack Reservoir to become eutrophic. Isn't Haystack Reservoir already eutrophic? Where is the basis of scientific fact? What percentage increase in phosphorus would occur? How does this compare with Crooked River water currently pumped into the canal? We feel the authors need to do more homework on this item.

b. On page 99, paragraph 4, and page 100, paragraph 4; the report refers to a fishery in the North Unit Canal. There may be some fish that get through the screens and take up residence in the canal but there is no recognized fishery.

c. On page 98; the report identifies nitrates as a possible health hazard to Madras residents if effluent goes to the canal. What concentrations of nitrates will occur? What percentage increase will that be over existing levels? How does that compare with drinking water standards?

3 d. On page 99,, last paragraph; the report discusses deleterious increases in ammonia if discharged to the Deschutes. What magnitude of increase is anticipated? Where are the facts?

4 e. On page 100, last paragraph; the report again tells of accelerated eutrophication of Haystack Reservoir. The report should contain analytical data and be more factual if it is going to contain such statements.

f. On page 111, fourth paragraph; the report includes an estimate from the Bureau of Reclamation that Bend effluent would double or triple the aquatic weed control problem in the canal. Without some scientific basis to back up such a statement, it should not be in the report.

5 g. On page 113, third paragraph; the report states that if effluent were discharged to the Deschutes River domestic use could be prohibited. That is a bold statement to make without any technical data to back it up.

5 h. On page 115, last paragraph; the report states that nitrate removal would be necessary if discharge was to the Deschutes River. Where is the data?

6 i. On page 116, last paragraph; the report suggests that advanced waste treatment should proceed land irrigation. That is not normally true, especially in an area as remote as the proposed plant site.

7 j. On page 117, paragraphs 4 and 5; the report discusses mitigation of public health risks associated with sewage effluent in the canal. The risks are blown out of proportion.

8 The report should recognize the sewage effluent as a resource rather than strictly a public health hazard. The Department predicts that regardless of what disposal method is initially used, eventually it will be put to beneficial use, especially during summer months.

We agree with the premise that the potential for groundwater contamination is greatest with continued use of raw sewage drain holes; therefore, it would seem appropriate for the report to state that regardless of what ultimate disposal means is finally adopted, it should not preclude the use of interim temporary subsurface disposal until ultimate disposal can be implemented.

Thank you for the opportunity to review the draft EIS.

Sincerely,

William H. Young

William H. Young
Director

CKA:le
WL0312

Response to Comments from the Oregon State Department of Environmental Quality, December 7, 1979

1. Comment noted. Revisions were made in the FEIS where appropriate.

2. Comments noted. If discharge to the North Unit Main Canal is reevaluated as an ultimate method of effluent disposal, a more complete analysis of water quality, canal maintenance, and public health impacts will be required by EPA.

3. Comments noted. Discharge of effluent to the Deschutes River has been dropped from consideration as an ultimate method of effluent disposal.

4. See Response to Comment #2.

5. See Response to Comment #3.

6. Land application of effluent via spray irrigation has been dropped from consideration as an ultimate method of effluent disposal.

7. See response to comment #2.

8. Comments noted.

Public Hearing Summary

On December 4, 1979, the Environmental Protection Agency held a public hearing on the draft Environmental Impact Statement (EIS) concerning sewage effluent disposal for the City of Bend, Oregon. Due to the costs involved, the public hearing record was not reproduced for this final EIS. A summary of the hearing is provided below, however, and a table has been prepared listing the speakers and their specific areas of concern (Table 4-2).

Representing EPA at the hearing were: Brian Hansen, Hearing Officer; Roger Mochnick, Project Officer; Norm Sievertson, Chief of Grant Operations; William Sobolewski, Project Engineer; and Dr. Charles Hazel, EIS consultant of Jones & Stokes Associates.

Bill Sobolewski and Charles Hazel commenced the meeting with a brief discussion of the project's history, the alternative methods of sewage effluent disposal, and the environmental impacts associated with the alternatives. Public testimony followed the presentations, with approximately nine people participating. Following is a summary of their remarks:

Richard Carlson, the Mayor of Bend, discussed the City's request for the EPA's approval and funding of an interim method of effluent disposal due to the delays in selecting an ultimate method of disposal.

Ted Fies, of the Oregon Department of Fish and Wildlife, stated that the department's preferred alternative is the development of a series of sealed ponds that would enhance wildlife habitat, although they realize that the costs associated with this alternative are prohibitive. The department finds the discharge of effluent into both the Deschutes River and the North Unit Irrigation Canal unacceptable, as the resulting increase in nutrients is conducive to nuisance algae blooms.

Nels M. Hansen, the Mayor of Metolius, expressed concern that subsurface disposal had received any consideration in the EIS due to the potential impacts it could have on the potable water supply in the area.

Ted Matylinski, President of Metolius City Council, remarked that if effluent was discharged into the North Unit Irrigation Canal, the excess effluent not used for irrigation would flow into the Deschutes River and adversely impact the quality of fishing. He suggested using the excess effluent for domestic uses, such as watering lawns.

Sam Johnson, Mayor of Redmond, stated that the City of Redmond is concerned about water quality and is supportive of the sewer project, but strongly opposes the discharge of effluent into the earth or the Deschutes River.

Doug Wilkinson, Legal Counsel for the North Unit Irrigation District (NUID), stated that the North Unit Board remains opposed to the discharge of effluent into the canal. Mr. Wilkinson also briefly discussed the legal and technical problems associated with discharging effluent into the canal. His main legal concerns centered on whether or not the canal's current status as a non-point source pollutant would change if effluent was discharged into it, and if so, when would the NUID be required to obtain a discharge permit? Also of concern is the fact that the portions of land occupied by the canal are in fee title to the United States and a great majority of it is also easements, which could have legal ramifications if effluent is discharged into the canal. He also expressed concern that organo-chlorides and organomines (by-products of the chlorine used to treat sewage) could have potential adverse impacts on crops in the Bend area.

Paul Ramsay, President, Avion Water Company, stated that the Avion Water Company is concerned about the method of effluent disposal the City will be employing due to the potential adverse impacts some methods may have on groundwater quality. He also remarked that in the event groundwater becomes contaminated as a result of the disposal method used by the Bend treatment plant, Avion Water Company would hold liable all parties involved in the licensing and operation of the plant. These parties would be held responsible for the public health of Avion's customers, the expense of interim service to provide safe drinking water, and the cost of developing new sources.

Arthur Sykes, representing the Pomona Grange of Jefferson County, stated that Pomona's three granges oppose discharging effluent into the canal and the Deschutes River and recommended that the COI be considered as a method of effluent disposal.

Gordon Priday stated that he is supportive of the Bend sewer project and prefers the filter pond alternative. He considers effluent a valuable resource and opposes disposal methods such as drill holes, that eliminate the opportunity to reclaim the water.

Table 4-2. Summary of Public Hearing Testimony for the City of Bend Draft EIS

	GROUNDWATER	SURFACE WATER	LAND USE PLAN	VEGETATION	HEALTH/SANITATION	FOOD CROPS	RECREATION/AESTHETICS	FISH AND WILDLIFE	ALTERNATIVES	LEGAL/LIABILITY	COSTS
R. Carlson									X		X
T. Fies		X	X	X				X	X		X
N. Hansen		X			X		X		X		
T. Matylinski		X					X	X	X		
S. Johnson		X							X		
D. Wilkinson		X				X	X		X	X	
P. Ramsay	X				X				X	X	
A. Sykes					X				X		X
G. Priday		X			X		X	X	X		X

Chapter 5

Comments and Responses to the Finding of No Significant Impact, FNSI, and Supplemental FNSI

Chapter 5

COMMENTS AND RESPONSES TO THE FINDING OF NO SIGNIFICANT IMPACT (FNSI) AND SUPPLEMENTAL FNSI

Letters of Comment

This section contains letters of comment from agencies and individuals on the June 9, 1980 FNSI and the August 15, 1980 Supplemental FNSI on an interim effluent disposal facility. The June 9 FNSI and August 15 Supplemental FNSI are included in Appendix A. Those letters which commented directly on the FNSI and Supplemental FNSI have been reproduced in this section. Wherever a response is required by EPA to the letter, a response page or letter follows.

The EPA wishes to express its appreciation to all commenting agencies and organizations for the time and effort spent in reviewing the FNSIs. All comments were fully considered prior to formulating the EPA's recommended action for interim effluent disposal.

Route 1 Box 254
Powell Butte, Oregon

June 23, 1980

TO: U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101

RECEIVED
JUN 27 1980

FROM: W. C. Steelhammer
Route 1 Box 254
Powell Butte, Oregon 97753

SUBJECT: Environmental Impact Assessment
City of Bend
Project No. C-410486

To Whom It May Concern:

After studying the environmental impact assessment, I was appauled. There are several errors, omitions, and faulsehoods that could not be overlooked. See Environmental Impact Assessment for the City of Bend, Project No. C-410486.

A. Dry lake bed--no dry lake bed exists.

B. 160 acres pond: no mention is made of a 500 foot wide buffer zone that will require a total of 470 acres. This buffer zone will be cleared of all vegetation and plowed.

C. The current grazing potential of the site is low due to limited vegetation and water--compared to what?

The area in question has an excellent stand of grass and is fine grazing. This pasture is better than most others in this vacinity. Livestock water is readily available from the North Unit Canal which is adjacent to the proposed pond.

D. Remote location: inaccessible: This site is less than two miles from the Bend Airport. McGrath road which crosses the highway between Powell Butte and Bend, runs along one edge of the dyking berm on the proposed pond. McGrath road, omitted conveniently from the map, is improved and maintained as an access to the sewage treatment plant. The pond is less than a mile from the highway on this improved road. The Powell Butte-Bend highway is the main artery for those of us living in Powell Butte, Prineville and Wheeler County to Bend, the main shopping and medical center in the area.

E. Sparse vegetation: Area in question is densely covered with Juniper trees. The site is considered part of a juniper forest. (there are two juniper forests in the world: one centered at Redmond, Oregon 10 miles from this site and the other in Jerusalem.)

F. Ponding of a natural area: The area is not sparsely vegetated as pointed out above. Visual effects of a 160 acre sewage lagoon in the middle of 470 acres completely devoid of vegetation is neither natural or aesthetically pleasing--nor will it blend with the surrounding terrain.

G. Mr. Steelhammer could be allowed to graze in an adjacent area. If this is so, why hasn't Mr. Steelhammer been given a firm grazing right to this area?

H. There are other statement that are misleading and should be corrected but space, time and urgency of this message prevents me from doing so.

COMMENTS:

It seems apparent to those of us that know the area that the assessment survey was made from a desk top in Seattle. The authors of the assessment could not have overlooked the abundance of juniper trees, grass, water and the road if they had ever set foot on the pond site. If they had, they could not have written this assessment.

The assessment has all the ear marks of a white-wash job to justify a 53 million dollar treatment plant already constructed. Total cost of the project to the taxpayer of approximately 75 million. It should be obvious to all that the assessment would have been more convincing had it been accurate.

If this assessment is a sample of the efficiency and thoroughness of our government, then thank God, we are not getting all the government that we are paying for.

SOLUTION:

The proposed sewage disposal site be re-assessed. Re-apprasal should be made by personnel on site.

State all facts accurately. Cover, topography, and access roads.

Other alternatives should be considered that were not mentioned in assessment. Irrigation with effluence near pond site. Treated water could be let into North Unit Canal.

Effluence could be stored in North Unit Irrigation Reservoir. (Haystack Reservoir).

Treated sewage effluence from the Prineville, Oregon sewage treatment plant is dumped into Crooked River and pumped from Crooked river into the North Unit Irrigation Canal at Smith Rock.

Mr. Ray Shumway of Powell Butte, Oregon has offered to dispose of treated waste water through storage and irrigation.

After spending over 50 million of the taxpayers dollars, it is doubtful that the E.I.S. will reach a different conclusion from the Environmental Assessment. All efforts should be made to make it less the white-wash job it is.

Let us hope that this can be corrected before the opposition to this project, there are many, and the news media discover the shortcomings of this impact assessment. To those of us who have spent our lives on this land the assessment is not acceptable.

My purpose is to inform and to preserve a grazing right as it was in the 1960's that is imparative to my survival as a rancher.

Sincerely,

W. C. Steelhammer

4.01
Bend

M/S 443

[illegible]

Mr. W. C. Steelhammer
Route 1 Box 254
Powell Butte, Oregon 97753

Dear Mr. Steelhammer:

Thank you for your comments dated June 23, 1980 on EPA's Finding of No Significant Impact for the City of Bend's proposed interim effluent disposal project. EPA's assessment process which included numerous studies and meetings on the proposed project has enabled us to conclude that the percolation/evaporation pond alternative is the most institutionally acceptable and environmentally sound method for interim effluent disposal.

As you are aware, EPA is presently in the process of completing an Environmental Impact Statement (EIS) which evaluates numerous alternatives associated with ultimate effluent disposal. As a part of this study, members of my staff have spent considerable time in the project area directing specific studies on the suitability of the proposed interim disposal site, and other sites, for effluent disposal. One of the alternatives evaluated by EPA was discharge to the North Unit Irrigation Canal. In a meeting with the Board of Directors, however, it was clearly stated that the City would not be allowed to discharge to the canal on an interim basis. Discharge to the canal for ultimate disposal will remain as an alternative in the Final EIS.

Our present schedule calls for the release of the Final EIS in January 1981. Your name is on our mailing list and you will receive a copy upon its availability.

Sincerely,

Robert S. Burd
Director, Water Division

bcc: Bill Sobolewski

Advisory
Council On
Historic
Preservation

1522 K Street, NW
Washington, DC 20005

Reply to:

Lake Plaza South, Suite 616
44 Union Boulevard
Lakewood, CO 80228

June 25, 1980

RECEIVE
REGION
JUN 30 1980
WATER DIVISION

Mr. Robert S. Burd
Director, Water Division
U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101

Dear Mr. Burd:

We note in the Finding of no Significant Impact report submitted June 9, 1980, that the construction of the Percolation/Evaporation interim effluent disposal facility, at the City of Bend, Oregon, an undertaking assisted by the Environmental Protection Agency (EPA project No. C-410486) may have an effect on archaeological sites.

These properties may possess archaeological significance and therefore may be eligible for inclusion in the National Register of Historic Places.

Section 800.4(a) of the Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800), sets forth the method of evaluating the significance of such properties. We request that you initiate this evaluation and inform us of your findings. If the evaluation results in a determination by the Secretary of the Interior that the property is eligible for inclusion in the National Register, you should follow the remaining steps in Section 800.4 to evaluate the effect of the undertaking on the property and, if appropriate, request the Council's comments. Should you have any questions or require additional assistance, please call Betty J. LeFree at (303) 234-4946, an FTS number.

Thank you for your cooperation.

Sincerely,

Louis S. Wall
Chief, Western Division
of Project Review

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

M/S 443

JUL 18 1980

Louis S. Wall
Chief, Western Division of Project Review
Advisory Council on Historic Preservation
Lake Plaza South, Suite 616
44 Union Boulevard
Lakewood, CO 80228

Dear Mr. Wall:

This responds to your comments dated June 25, 1980 on the Finding of No Significant Impact for City of Bend Oregon's proposed percolation/evaporation pond.

The U.S. Bureau of Land Management (BLM) and the City are presently negotiating a land lease with purchase option agreement for the proposed site. As a part of this process a 100% archaeological survey of the project area was conducted. The survey concluded that none of the sites identified are eligible for inclusion in the National Register of Historic Places. Because the proposed project is located on land administered by the BLM, it is our understanding that they are submitting a determination to your office in compliance with Section 800.4, 36 CFR Part 800. We further understand that if any mitigation measures are required, provisions will be included in the lease agreement.

Sincerely,

Robert S. Burd
Director, Water Division

United States
Department of
Agriculture

Soil
Conservation
Service

1220 S.W. Third Avenue
16th Floor
Portland, OR 97204

September 17, 1980

RECEIVED
REGION

SEP 22 1980

WATER DIVISION

Mr. Robert S. Burd M/S 443
Director, Water Division
U. S. Environmental Protection Agency, Region X
1200 Sixth Avenue
Seattle, WA 98101

Dear Mr. Burd:

The Soil Conservation Service has reviewed the Supplemental Finding of No Significant Impact for construction of Percolation/Evaporation Interim Effluent Disposal Facility, City of Bend, Oregon.

We have no comments to offer.

We appreciate the opportunity to review and comment on this Notice of Finding.

Sincerely,

William S Dugan
GUY W. NUTT Acting
State Conservationist

cc: Administrator, SCS, Washington, DC
Thomas N. Shiflet, Director of Ecol Sci, SCS, DC

RECEIVED

SEP 23 1980

EPA-EIS

The Soil Conservation Service
is an agency of the
Department of Agriculture

SHAKLEE INDEPENDENT DISTRIBUTOR

SEP 1980
RECEIVED
Bureau of
Land Management
Prineville, Oreg.

61655 Ward Road
Bend, OR 97701
Sept. 12, 1980

U. S. Enviromnental Protection Agency
Region X
1200 Sixth Avenue
Seattle, WA 98101

Sirs:

RE: RINDING OF NO SIGNIFICANT IMPACT # [illegible]
dated Aug. 15, 1980

Our opinion and comment:

We feel a minimum of 5 (five) feet of soil should be required on all areas of the disposal area for filtration purposes.

1 Also, we feel that all leakage into the lava should be sealed (possibly with soil or clay) and again meet the five (5) feet minimum filtration standard.

May we say that compared with drinking impure water, the effect of the affluent on the enviromment is likely to be cause for little concern.

Sincerely,

Herbert Finley
Betty J. Finley

Concerned citizen.

RECEIVED
SEP 1 8 1980
[illegible]

We'll call on you!®

Distributor of: Household Cleaners • Lovue Beauty Aids • Deux Vies and Lady Shaklee Fragrances
Shaklee For Men Original and Golden Manner Toiletries
Food Supplement 99 Small Wonder Baby Products

INDEPENDENT DISTRIBUTOR FOR SHAKLEE CORPORATION
DSA
Member Firm of

Response to Comments from G. S. and B. J. Priday, September 12, 1980

1. Comments noted. The interim effluent disposal pond will contain a minimum of three to five feet of soil for percolation. All lava cracks within the infiltration pond will be sealed if found to cause significant seepage.

Public Hearing Summary - June 9, 1980 FNSI

On March 5, 1980, the Bend City Commission held a public hearing on the EPA June 9, 1980 FNSI concerning an interim effluent disposal facility for the City of Bend, Oregon. Due to the costs involved, the public hearing record was not reproduced for this Final EIS. A complete record of the public hearing is available at the Bend City Hall.

The hearing began with a presentation by N. Dempsey of BECON, who described the proposed interim effluent infiltration pond and the BLM lease area. Following Mr. Dempsey's description of the disposal facilities, their cost and impacts, the hearing was opened for public testimony.

Comments made at the hearing follow, as summarized by BECON in Design Definition Memorandum No. 11 (December 1979).

> "The first citizen to testify represented a Bend Chamber of Commerce committee which has been studying the project. The speaker explained that the committee favors an infiltration pond and opposes a drill hole or fractured-rock disposal method. The committee feels that the interim effluent pond may be useful in the future for irrigation and appears to be the best possible solution at this time. He recommended that citizens be more involved in the selection of a final disposal solution. To accomplish this, a seven-member citizens' advisory committee was proposed. The committee would be appointed jointly by the City Commission and the County Board of Commissioners. He stated that in response to the proposal, which had previously been presented to the County Commissioners, they agreed to consider it at their next meeting. The City made no commitment. It is generally felt that the degree of citizen involvement to date has been adequate and in compliance with applicable regulations. Further public involvement in the selection of a final disposal method seems more properly an adjunct to the Environmental Impact Statement process, which is currently underway to address this issue. The City's action (or no action) does not prevent the formation of Ad Hoc citizens' committees, the continuation of the Chamber of Commerce task force, or the formation of citizens' committees to advise EPA during the preparation of the final Environmental Impact Statement.
>
> "The second and final citizen to speak was a landowner in the Powell Butte area who holds a grazing permit on the property that would be used for the holding pond. He explained that he had used the property for 20 years and that the Bureau of Land Management had indicated that they may allow him a permit elsewhere. He clarified the amount of acreage that would be required

for the system, explaining that a total of 470 acres would be involved when the berms, buffer zone, and fencing around the 160-acre pond were included. He objected to spending $752,000 on an interim solution. As an alternative, he suggested discharging effluent to the North Unit Irrigation District Canal. The acting Chairwoman replied that the discharge alternative is being considered as one of the ultimate solutions. Secondly, the interim pond may become a part of the ultimate solution."

Chapter 6
List of Preparers of FEIS

Chapter 6

LIST OF PREPARERS OF FEIS

Roger K. Mochnick, EIS Preparation Team Leader, Environmental Evaluation Branch, Environmental Protection Agency, Region 10, Seattle, Washington.

Norman B. Sievertson, Project Services Team Leader, Wastewater Operations Branch, Environmental Protection Agency, Region 10, Seattle, Washington.

William Sobolewski, Project Engineer, Oregon Operations Office, Environmental Protection Agency, Portland, Oregon.

Charles R. Hazel, Ph.D., Vice President, Jones & Stokes Associates, Inc., Sacramento, California. Project Manager.

Karen J. Miller, M.S., Jones & Stokes Associates, Inc., Portland, Oregon. EIS Coordinator.

Robert B. Williams, P. E., Culp/Wesner/Culp, El Dorado Hills, California. Sanitary Engineering.

Chapter 7

Bibliography

Chapter 7

BIBLIOGRAPHY

References

Bend Engineering Consultants. 1977a. City of Bend, Oregon, wastewater collection, treatment and disposal facilities. Design Definition Memoranda Nos. 1-9.

__________. 1977b. City of Bend, Oregon, wastewater collection, treatment and disposal facilities. Supplemental environmental impact assessment: amendment no. 1 to sewerage facilities plan. Bend, Oregon.

__________. 1979. City of Bend, Oregon, wastewater collection, treatment and disposal facilities. Design definition memorandum no. 11: subsurface effluent disposal feasibility investigation. Bend, Oregon.

__________. 1980a. City of Bend, Oregon, wastewater collection, treatment and disposal facilities. Environmental information document: effluent containment pond and groundwater monitoring system. Bend, Oregon.

__________. 1980b. Monitoring well system for interim effluent containment area, City of Bend, Oregon. Unpublished report prepared for U.S. Bureau of Land Management. 2 pp.

Jones & Stokes Associates, Inc. 1979. Sewage effluent disposal for the City of Bend, Oregon: draft environmental impact statement. U.S. Environmental Protection Agency, Seattle. EPA 910/9-79-063. 153 pp.

Pound, C., and R. Crites. 1973. Wastewater treatment and reuse by land application. 2 vols. U.S. Environmental Protection Agency. EPA 606/2-73-006a,b.

Sceva, J. 1968. Liquid waste disposal in the lava terrane of central Oregon. Federal Water Pollution Control Administration, U.S. Dept. of Interior.

Stevens, Thompson and Runyan, Inc., and Tenneson Engineering Corporation. 1976. Sewerage facilities plan, City of Bend, Oregon. 2 vols.

U.S. Environmental Protection Agency. 1971. Manual for evaluating public drinking water supply. Washington, D.C.

__________. 1975. Best practicable waste treatment technology program guidance memorandum PG-27A. Washington, D.C. 2 pp.

Personal Communications

Carnahan, J. 1980. Bend Engineering Consultants, Bend, Oregon.

Dempsey, N. 1980. Bend Engineering Consultants, Bend, Oregon.

Paterno, P. 1980. U.S. Bureau of Land Management, Prineville, Oregon.

Ziegler, M. 1980. U.S. Bureau of Land Management, Prineville, Oregon.

Chapter 8
Appendix

Chapter 8

APPENDIX

Appendix A

June 9, 1980 Finding of No Significant Impact

and

August 15, 1980 Supplemental Finding of No Significant Impact on Interim Effluent Disposal Facility

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: M/S 443

JUN 9 1980

FINDING OF NO SIGNIFICANT IMPACT

To All Interested Government Agencies and Public Groups:

In accordance with the procedures for the preparation of environmental impact statements, an environmental assessment has been performed on the below proposed Agency action:

Public Law 95-217 grant to:

City of Bend
P. O. Box 431
Bend, Oregon 97701

For construction of:

Percolation/Evaporation interim effluent
disposal facility
EPA Project No. C-410486

The assessment process did not indicate a significant environmental impact from the proposed action. Consequently, an environmental impact statement will not be prepared. A copy of the environmental assessment summarizing the impacts and explaining why a statement is not required, is attached.

Comments supporting or disagreeing with this decision may be submitted to EPA for consideration. After evaluating the comments received, the Agency will make a final decision; however, no administrative action will be taken on the project for at least thirty (30) calendar days after release of this Finding of No Significant Impact.

Sincerely,

Robert S. Burd
Director, Water Division

Attachment

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: M/S 443

ENVIRONMENTAL IMPACT ASSESSMENT

A. Project Identification

Name of Applicant: City of Bend
Address : P. O. Box 431
Bend, Oregon 97701

Project Number : C-410486

Project Description: Percolation/Evaporation interim effluent disposal facility (See Negative Declarations for City of Bend, dated April 5, 1977, and May 3, 1978, for additional information)

Estimated Maximum Eligible Costs	$ 852,000
EPA Share: (85%)	724,200
Applicant Share: (15%)	127,800

B. Assessment Summary

1. Description of the Proposed Project

a. Background

On September 27, 1978 the Environmental Protection Agency released to the public a "Notice of Intent" to prepare an Environmental Impact Statement (EIS) which would evaluate in detail the environmental impacts associated with a number of alternatives designed to provide effluent disposal for the City of Bend's new wastewater treatment plant. Because the City's new treatment facility was scheduled for completion and start-up in late 1980 and the

City's financial planning was based accordingly, it was recognized that the EIS process and selection of an effluent disposal alternative may not be complete and that an interim method of effluent disposal would be required. Emphasis was therefore changed by the City and EPA to evaluating and selecting an interim effluent disposal alternative while delaying the remaining steps required to complete a Final Environmental Impact Statement on the ultimate effluent disposal alternative.

After release of EPA's Draft EIS and EPA's public hearings, numerous meetings were held between the City of Bend, the Oregon Department of Environmental Quality and EPA to discuss interim effluent disposal alternatives. As a result of these meetings the City's consultants, BECON, prepared Design Definition Memorandum No. 11, "Subsurface Effluent Disposal Feasibility Investigation" dated December 1979. In Memorandum No. 11, the City recommended the design and construction of a surface infiltration-overflow pond for interim effluent disposal along with an extensive wastewater monitoring program. Under the alternative proposed by the City, effluent would be discharged to an existing 160 acre dry lake bed. The pond would then allow natural percolation of the effluent through the existing surface soil layers. In the center of the natural depression the City proposed to clear away the existing soil layers and construct earth dikes including other overflow devices to allow for effluent overflow in the event the percolation rate through the natural soils proved to be too slow in comparison to the amount of effluent to be discharged. After review of Memorandum No. 11 EPA gave the City conditional approval of this alternative excluding the overflow features and the clearing of the clay overburden near the center of the natural depression. EPA's conditional approval was based on a number of additional concerns that would need to be satisfied prior to a decision to provide grant assistance for the construction of the proposed interim effluent disposal project. These additional concerns were addressed by BECON in a February 1980 report entitled "Environmental Information Document, Effluent Containment Pond and Ground Water Monitoring Systems."

b. Relationship to Environmental Impact Statement

As a result of this immediate need to provide the City of Bend with a method of discharging effluent generated at the new wastewater treatment facility, EPA has decided to delay its recommendation for an ultimate effluent disposal alternative.

Because the interim disposal alternative is considered to be an effective environmentally sound method of effluent disposal EPA will include this alternative in its evaluation of an ultimate disposal solution. As an ultimate solution, the environmental impacts will need to be evaluated taking into account the increased effluent discharge flow from 1.5 mgd to 6 mgd. It is expected that the Final Environmental Impact Statement can be completed and released for public review in January 1981.

c. Description

The project as proposed includes an effluent pumping station and force main; an evaporation/percolation pond and monitoring facilities. The project will serve initially as an interim facility and potentially as the ultimate system or a component thereof.

The proposed effluent treatment/disposal facility consists of a 160 acre ponding area developed by diking lower boundaries of a natural depression. Effluent will be conveyed to the ponding area through an effluent pump station and force main. The ponding area will have storage capacity of approximately 510 million gallons and will serve as a natural sump providing effluent disposal through evaporation and percolation. Based upon proposed conservative percolation rates and upon evaporative losses, the minimum capacity of the disposal facility should be approximately 3.0 mgd. Experience from operation of the facility will establish actual percolation capabilities which may indicate that the interim facility can approach or exceed the 20 year design capacity requirements.

Effluent discharged to the ponding area will have received secondary treatment including disinfection. Further effluent polishing by percolation through existing natural soils at the effluent disposal site will reasonably assure that EPA requirements for best practicable wastewater treatment technology will be achieved.

Monitoring facilities utilizing both existing and newly constructed wells will be included as a component of the project to assure that the effects of effluent disposal upon the quality of the underlying ground water can be monitored. Monitoring facilities are to be developed sequentially with actual locations and depths based partially upon hydrogeologic investigations and upon experience with migration of the effluent plume.

While some diking is proposed, EPA will require that control diking, forming alternate basins or cells for intermittent flooding and drying, and for maintenance purposes will be included initially in the project. Such provisions are to be included to assure that natural sealing of the pond bottom is prevented.

2. Probable Impact of the Proposed Project

The environmental impacts associated with the construction of the evaporation/infiltration pond at Site E will be minimal. Excavation and clearing operations will temporarily expose soils to wind and water erosion. These impacts, however, will be limited due to the natural gentle slope of the depression and because the area experiences little precipitation. Deposition of any wind driven dust particles is not considered significant due to the remoteness of the site.

Use of this site will also require the conversion of 160 acres of marginal terrestrial wildlife habitat for use of the proposed facilities. The current grazing potential of the site is low due to limited vegetation and water. Alternative future uses of the land are limited by accessibility, water availability, soil types and rock outcrops. Because the site is presently under ownership to the U.S. Bureau of Land Management (BLM), the City of Bend has submitted an application for land lease with an option to purchase. As a result of this action BLM is presently preparing an environmental assessment which will evaluate the proposed conversion of the site from its existing use to an evaporation/infiltration pond. It is expected that BLM will complete its assessment this month.

The percolation/evaporation pond will have little visual impact upon the environment because of its construction features and the remote location. Diking will be low profile and will be blended into the existing natural ground relief.

Although the project will result in the ponding of a natural area with sparse vegetation, the visual effect of a body of water in this remote area may aesthetically pleasing to those few persons traversing the area.

Impacts on archeological sites and the Bend-Prineville wagon road have been investigated. The impact on known archeological sites will be mitigated through mapping, description, photography, and disallowing ground disturbing activities such as clearing or scarification or dike relocation. The Bend-Prineville wagon road has been determined noneligible for the National Historic Register. The proposed pond will inundate approximately ¼ mile of the road. This impact could only be reversible if the ultimate effluent disposal method resulted in the selection of a different site.

3. Probable Environmental Impacts That Cannot Be Avoided

   a. Construction related impacts are determined to be insignificant due to the remote site location. The following impacts will occur, however they will be temporary.

      (1) Increased dust levels
      (2) Higher noise levels
      (3) Traffic disturbances and associated public inconveniences

   b. Conversion of open space land to public facilities use.

   c. Inundation of ¼ mile of the Bend-Prineville wagon road.

4. Alternatives Considered

   The following six alternatives for interim effluent disposal have been considered.

   a. Disposal to Basalts Above Pumice Deposit. This alternative incorporates disposal to the basalts above the compact pumice/ash deposits. Reliability of this approach is uncertain in terms of the reservoir capacity of the basalts and their ability to accommodate design discharge loads.

   b. Drillhole to Void Zone at 215- to 240-Foot Depth. Effluent disposal by means of a drillhole extending to the cavernous zone could be accomplished with high reliability, due to reservoir capacity and the ability of the zone to accommodate effluent discharge flows. The system would be simple to construct and would minimize maintenance effort and cost.

   c. Drillhole to Artificially Fractured Basalts Beneath the Pumice Deposit. Disposal of effluent into artificially fractured basalts and interflow sedimentary deposits underlying the pumice deposit may allow shallower dispersion than Alternative B, and increase effluent retention time and additional filtering potential prior to any effluent entry into the underlying cavernous zone.

      The capability of the fractured material to accommodate the design effluent loads by permeation through the fractures is not well defined, and reliaibility of this approach is uncertain.

d. Surface Infiltration-Evaporation and Overflow to Adjacent Basins. Effluent discharge into the Site "E" basin (100± acres) east of the treatment plant site would provide disposal to a limited extent by evaporation, but primarily by infiltration through the existing soil mantel into the subsurface. Effluent exceeding evaporation and infiltration losses will overflow to adjacent basins to the east-southeast.

e. Combined Surface Infiltration and Subsurface Percolation. Effluent would be disposed into an excavated pond area of approximately 200 acres in and adjacent to the Site "E" basin. The pond construction includes removal of the soil overburden over a 10± acre area, to expose the underlying basalt, which would be fractured to depths of 125± feet to develop a percolation zone.

f. Surface Infiltration-Overflow Pond and Percolation Zone. This concept is similar to Alternative e, with effluent discharged only into the Site "E" basin, which would allow infiltration through approximately 100 acres of natural soil deposits into the subsurface. An overflow system is included, composed of a 10± acre excavation near the basin center that is extended to the underlying basalt. The excavation perimeter would be elevated by berms to control ponding in the basin area to a specific elevation prior to overflow into the excavation. The basalt in the excavation bottom would be fractured to increase permeability.

This alternative excluding the overflow features is the only alternative approved by EPA for grant funding.

5. Relationship Between Short-Term Uses of the Environment and Long-Term Productivity

The proposed changes in the project involve a tradeoff of short-term environmental impacts for long-term productivity. The short-term impacts are mostly related to construction, such as increased noise and dust levels. These impacts will be noticeable, but are only temporary and should not persist beyond completion of construction. Long-term gains will result from utilizing the site for an interim effluent disposal pond. Provision of adequate sewerage service to the City of Bend will allow growth to continue and allow room for expansion of the economic base of the City. Long-term productivity will be enhanced.

6. Irreversible and Irretrievable Commitments of Resources:

Construction of the proposed facilities will result in the use of resources such as construction materials, energy, fuels and human resources. These resources are irretrievably committed.

7. Public Response to the Project

A public meeting on the environmental information document was held on March 5, 1980. Approximately 39 persons were in attendance at the public meeting. Following presentation of the proposed project by BECON, two people presented testimony. Mr. Wally Corwin, Bend Jaycees, indicated support of the project. Mr. Corwin recommended formation of a citizen advisory committee prior to the determination of the ultimate method of disposal. Mr. William Steelhammer, Powell Butte, objected to loss of grazing area because of the percolation/holding pond. To mitigate the grazing loss caused by the effluent pond, Mr. Steelhammer could be allowed to graze in an adjacent area which is tentatively planned to be used as a sludge disposal area for the wastewater treatment plant.

8. Agencies Consulted

a. U.S. Bureau of Land Management
b. U.S. Forest Service, Deschutes National Forest
c. Deschutes County
d. Oregon State Department of Water Resources
e. Oregon DEQ
f. SHPO

9. Reasons for Concluding No Significant Impact

The area at Site E is more remote and contains sufficient space to maintain a suitable buffer around the percolation/holding pond. An on- and off-site monitoring system will be used to detect any ground water contamination at the earliest possible point. EPA will continue its evaluation of an ultimate effluent solution in a Final EIS scheduled for completion in January 1981.

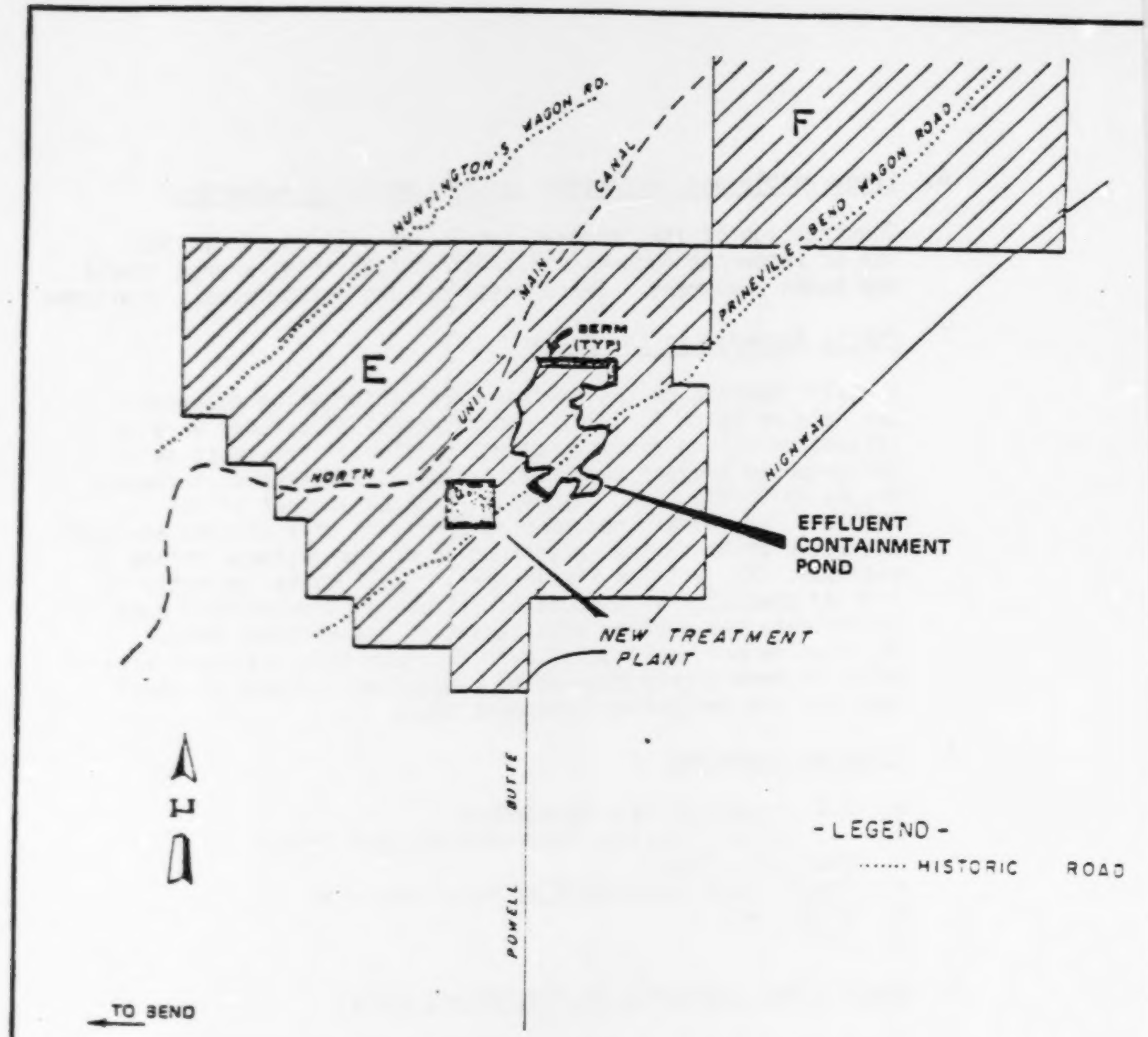

HUNTINGTON'S WAGON RD.
MAIN CANAL
NORTH UNIT
F
E
PRINEVILLE-BEND WAGON ROAD
HIGHWAY
BERM (TYP)
EFFLUENT CONTAINMENT POND
NEW TREATMENT PLANT
POWELL BUTTE
N
TO BEND
-LEGEND-
HISTORIC ROAD

FIGURE 2

HISTORIC ROADS IN THE PROJECT AREA

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO
ATTN OF: M/S 443

AUG 15 1980

SUPPLEMENTAL
FINDING OF NO SIGNIFICANT IMPACT

To All Interested Government Agencies and Public Groups:

On June 9, 1980, the Environmental Protection Agency (EPA) released a Finding of No Significant Impact (FNSI) on the proposed action described below:

Public Law 95-217 grant to:

City of Bend
P. O. Box 431
Bend, Oregon 97701

For construction of:

Percolation/Evaporation Interim Effluent
Disposal Facility
EPA Project No. C-410486

During the thirty (30) day comment period on the FNSI additional information was developed regarding the proposed action. Because this information provides additional analysis regarding the actual design and potential impacts of the proposed action, EPA has decided to supplement the original FNSI and re-open the comment period for an additional thirty (30) days.

Based on this additional information and the June 9, 1980 Environmental Assessment and FNSI, EPA has determined that an Environmental Impact Statement for the interim effluent disposal facilities will not be prepared. Comments supporting or disagreeing with this decision may be submitted to EPA for consideration. Copies of EPA's June 9, 1980 FNSI can be obtained by contacting the Environmental Evaluation Branch, M/S 443 at the above address.

Sincerely,

Robert S. Burd
Director, Water Division

Attachment

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: M/S 443

AUG 15 1980

SUPPLEMENTAL ENVIRONMENTAL IMPACT ASSESSMENT

A. Project Identification

Name of Applicant: City of Bend
Address : P. O. Box 431
Bend, Oregon 97701

Project Number : C-410486

Project Description: Percolation/Evaporation interim effluent disposal facility (See Negative Declarations for City of Bend, dated April 5, 1977, May 3, 1978, and FNSI June 9, 1980 for additional information)

B. Assessment Summary

1. Description of the Proposed Project

a. Introduction

On June 9, 1980, EPA issued a Finding of No Significant Impact (FNSI) which stated the Agency's NEPA decision concerning a proposed interim effluent disposal facility for the City of Bend, Oregon. During the comment period, following issuance of the FNSI, written comments were received from three sources as listed below:

1. Mr. W. G. Steelhamer, a local rancher who objects to the proposed action because of its impact on his ranching operations.

2. The Advisory Council on Historic Preservation who asked for EPA's determination on the eligibility of four archaeological sites for inclusion on the National Register of Historic Places, and

3. Becon, the City's consultant who provided technical comments and further project and site information.

None of the three comments were judged as significantly effecting the Agency decision and responses to all have been made.

In addition to the written comments, we were advised by the Oregon Department of Environmental Quality that after the Bureau of Land Management (BLM) had reviewed the FNSI statement, they expressed concerns. Subsequently, a meeting involving officials from BLM, EPA, DEQ, City of Bend and Becon was held. Discussions during that meeting revealed that some project features were not adequately described in the FNSI and that EPA's environmental decision needed to be further clarified.

This supplement is intended to provide to the public such additional project details and to further stress the Agency's conclusion of no significant impact.

EPA considers the proposed works described in the FNSI to be an interim effluent disposal facility but recognizes that such facility may remain in operation for a period of up to three years or longer and that such facility has the potential for becoming a part of the ultimate disposal solution. The ultimate disposal solution is not yet fully identified but will be addressed in the final EIS, which is scheduled for January 1981.

The draft EIS was completed in the fall of 1979, and a public hearing conducted in December, and comments relative to the proposed project received. At that time it had been recognized that there remained insufficient time to design and construct an acceptable ultimate solution which would allow the City to place their treatment plant into operation by late summer of fall of 1980, a startup schedule of great importance to the City because of its financial commitments. Efforts were subsequently concentrated toward identifying interim solutions for effluent disposal. These were presented in Becon's Design Definition Memorandum No. 11.

During the process of evaluating effluent disposal solutions, EPA has consistently opposed the use of drill hole or shattered rock solutions on the basis of potential contamination of the groundwater. The Regional Administrator made this clear to the Oregon Department of Environmental Quality in his letter of March 16, 1978, which stated that a drill hole situation could be approved only on an interim basis if no other feasible alternative solutions could be found.

Information contained in Becon's Design Definition Memorandum No. 11 suggested that an alternative interim disposal solution which would essentially meet the City's schedule and which would provide for the protection of the groundwater was available. That solution, presented in EPA's June 9, 1980, FNSI would provide natural filtration or soils treatment and evaporation of the effluent discharged from the City's new secondary treatment facility. EPA believes that such additional natural treatment will assure compliance with the Agency's requirement for Best Practicable Wastewater Treatment Technology (BPWTT). With this goal in mind, EPA was able to conclude that construction of the proposed interim facility would not be considered a significant environmental impact.

The FNSI as issued included several errors which are addressed below:

b. Description

1. The FNSI described the project as including "an effluent pumping station and forcemain." This is not correct. A "gravity pipeline" rather than "pump station and forcemain" is proposed for conveying treated effluents from the treatment plant to the disposal area.

2. Herbicides or other chemicals are not to be used for controlling weed growth on the dikes or pond bottom or on other areas in proximity of the effluent disposal facility. The intent of this restriction in the use of chemicals is to protect wildlife. Compliance will be assured through the use of a condition on the subsequent Step 3 grant.

3. Although the FNSI statement indicated that EPA would require control dikes, forming alternate basins or cells for intermittent flooding and drying and for maintenance purposes, to be included initially in the project to assure that natural sealing of the pond bottom is prevented; it presented only a brief description of the effluent disposal facility and thereby failed to fully describe certain special construction activities such as the location and details of diking, the quantity and source of borrow material including riprap, and the proposed highwater level. In addition, other features such as the stripping of vegetative material and the sealing of rock outcrop zones which are generally included in the design of percolation/evaporation pond systems were not mentioned within the FNSI. These other features, common with construction of similar projects, were, however, considered by the Agency prior to the making of its decision.

The location and the details of the control dikes which were not available at the time the FNSI was issued are now provided in a preliminary diking plan which is included as an attachment to this assessment. That plan provides preliminary locations for the dikes, indicates typical dike sections and locates an approximate highwater level for the facility. The proposed borrow areas for dike construction which are based on recently available soils information are also shown and approximate borrow quantities indicated. Removal of borrow material would result in improved infiltration rates and would also provide for the remaining soils layer to be a minimum of 3-5 feet in thickness.

2. Probable Impact of Proposed Project

The environmental impacts associated with the proposed project are discussed in EPA's June 9, 1980, FNSI. The following discussion is intended to supplement that information.

Stripping of vegetation within the pond bottom area was not discussed in the original FNSI but was considered to be a common practice in the construction of infiltration pond systems. Failure to clear brush and trees from the area would not only interfere with the disking of the pond bottom during maintenance periods, but would contribute to the sealing of the soils from the decay of vegetative matter.

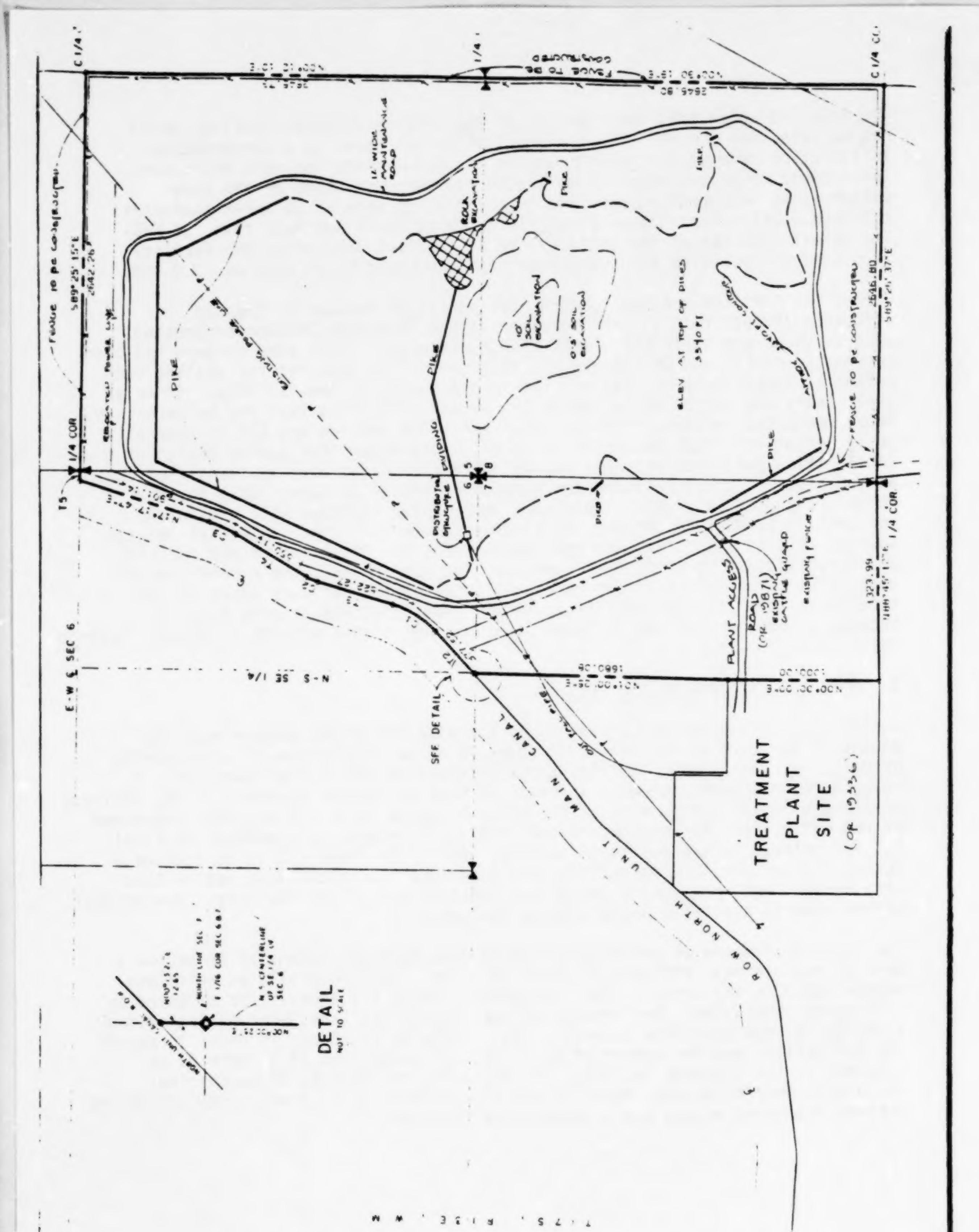
The FNSI indicated that the capacity of the interim disposal facility would not be less than 3.0 MGD. That approximation was based on a conservation infiltration rate of 0.3 gpd/ft^2 and an assumed evaporation rate which was later found to be too high. A more accurate estimate based on the same conservative infiltration rate and an evaporation rate of 30 in/yr indicates that the facility would have a sustaining capacity of not less than 2.5 MGD. The actual capacity of the facility can be realized only after the facility is placed in operation and the actual capacity could be as high as 3.0 MGD.

During the Portland meeting concern over potential leakage of treated effluents through rock outcrop zones or at the interface between projecting rock surfaces and soils was voiced by BLM officials. This same concern had been recognized by EPA and we had assumed that corrective measures for sealing such potential leaks would be provided for in the design of the facility. After a preliminary evaluation to determine the extent of sealing that may be necessary, Becon requested relaxation of the requirement for sealing and EPA is generally in agreement with such request. It is not anticipated that during design of the infiltration pond facility, the potential leakage areas will be identified and an appraisal of the likelihood for excessive leakage be made. Only for those which are judged as highly likely to allow seepage to occur will provisions for sealing be included within the bidding documents. Other potential leakage sources will be identified and monitored during the operation of the facility and inspected during maintenance periods. We believe that the expenditure of additional construction effort to assure total control of such leaks for an interim solution is not justified. In the event that the interim facility becomes a component of the ultimate solution, additional efforts to control leakage may become necessary.

3. Official Response to the Project

During the Portland meeting officials of BLM also expressed concern over the potential for further EIS delays in order to allow information obtained during operation of the interim facility to be included in EPA's final decision. A reluctance to accept piecemeal approval of what may become segments of the ultimate effluent disposal system without the prior issuance of an EIS was also expressed by BLM officials. As mentioned above, EPA fully intends to complete the Final EIS for release to the public in January, 1981. The Final EIS is to include a description of the interim facility and additional technical information that will become available during design and construction of the facility. Operational information if available would also be included.

The interim solution as presently proposed does have the potential to become a part of the ultimate effluent disposal solution. This possibility, which was acknowledged in the original FNSI statement, should not however, be accepted as a foregone conclusion. Performance of the interim facility, when evaluated over a period of time (possibly several years), would be necessary in order to assess its suitability and the extent of any necessary expansions if it were to be proposed as the ultimate facility. In addition, the results of monitoring would also need to be considered in any such further evaluations conducted during periods extending beyond the release of the Final EIS.


TREATMENT PLANT SITE (OR 19356)
NORTH UNIT MAIN CANAL ROW
DETAIL NOT TO SCALE
SEE DETAIL
E-W ¼ SEC 6
N-S SE 1/4
PLANT ACCESS ROAD (OR 19871)
EXISTING CATTLE GUARD
EXISTING FENCE
FENCE TO BE CONSTRUCTED
12' WIDE MAINTENANCE ROAD
ROCK EXCAVATION
10' SOIL EXCAVATION
0-5' SOIL EXCAVATION
ELEV AT TOP OF DIKES 3540.1
DIVIDING DIKE
DIKE
DISTRIBUTION STRUCTURE
EXISTING POWER LINE
1/4 COR
C 1/4 COR
S89°25'15"E
2642.26
N00°12'10"E
2646.74
N00°30'18"E
2646.80
2646.80
1323.99
1680.00
1320.00
N01°00'00"E
T 17 S, R 13 E, W M

APPENDIX B

EIS DISTRIBUTION LIST

BEND, OREGON EIS DISTRIBUTION LIST

Federal Agencies

Advisory Council on Historic Preservation
U.S. Department of Agriculture
U.S. Department of Defense
U.S. Department of Health, Education and Welfare
U.S. Department of Housing and Urban Development
U.S. Department of Interior
    Bureau of Land Management
    Fish and Wildlife Service
    Water and Power Resources Service
Federal Aviation Administration
U.S. Department of Transportation

State and Local Officials and Agencies

Office of the Governor
Oregon Aeronautics Division
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Health Division
Oregon Land Conservation and Development Commission
Oregon State Clearing House
Oregon State Department of Human Resources
Oregon State Historic Preservation Office
Oregon Water Resources Department
Ruth Burleigh, Mayor, City of Bend, Oregon
Arthur Johnson, Bend City Manager
Jack Donahue, Public Works Director, City of Bend
Nels Hansen, Mayor, City of Metolius, Oregon
Ted Matylinski, City Council, Metolius, Oregon
Samuel S. Johnson, Mayor, City of Redmond, Oregon
Edward English, City Manager, City of Redmond
Bub Miller, City Manager, City of Madras, Oregon
Deschutes County Health and Sanitation Department
Deschutes County Planning Department
R. C. Dodson, North Unit Irrigation District
Roger Wagner, North Unit Irrigation District

Organizations

Central Oregon Audubon Society
League of Women Voters
OSPIRG
1000 Friends of Oregon
Oregon Environmental Council

Local Distribution and Other Interested Parties

Ronald Ball
BECON
Bend Bulletin
Keith Carpenter
George Cook
Cooper-Clark and Associates
Culp, Wesner, and Culp
Thomas Gellner
Patrick Gibson
Leslie Graves
Bob Hamchett
Kris Hanson
Kenneth Harris
John Joyce
Gerald Knippel
KTVZ - TV
Frank G. MacMurray, Jr.
Bob Main
Errol Ohlde
Ronald Olson
Dr. William Orr
Gordon Priday
Paul Ramsay
C. E. Rhoads
James Smily
W. Steelhamer
Arthur Sykes
C. E. Ward
Doug Wilkinson